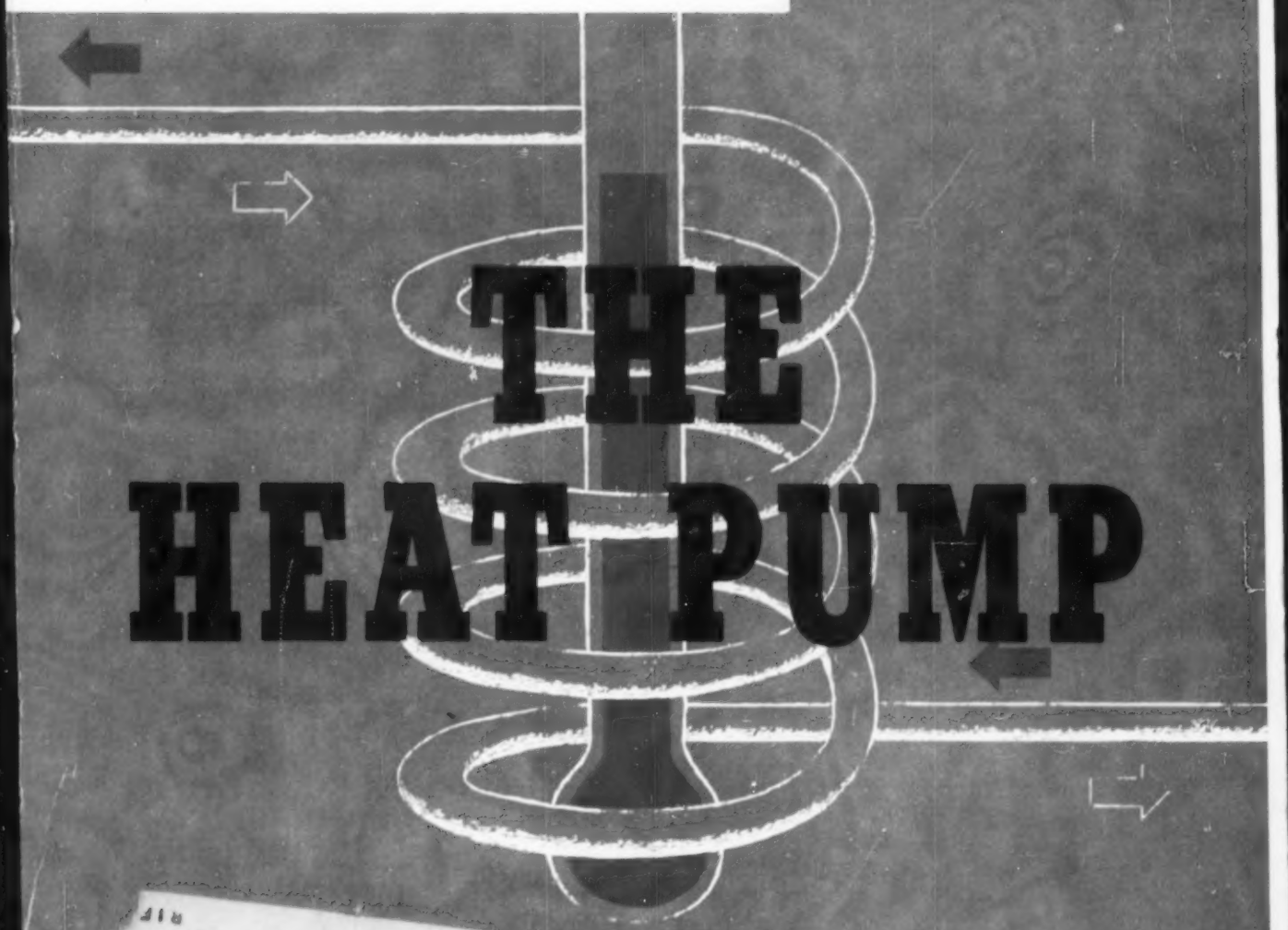
COMMERCIAL REFRIGERATION & AIR CONDITIONING

JANUARY 1956

FRANCHISE NO. CIRCULATION



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. . . its impact on your business

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The new 2, 3 and 5 H.P. suction-cooled Copelametics are designed especially for air conditioning and other high suction pressure installations. Oversize, finned-tube condensers on these models insure maximum efficiency in high ambient temperatures.

New specification sheets on Copelametic suction-cooled motor-compressors and condensing units give all the facts. Send for your copies TODAY.

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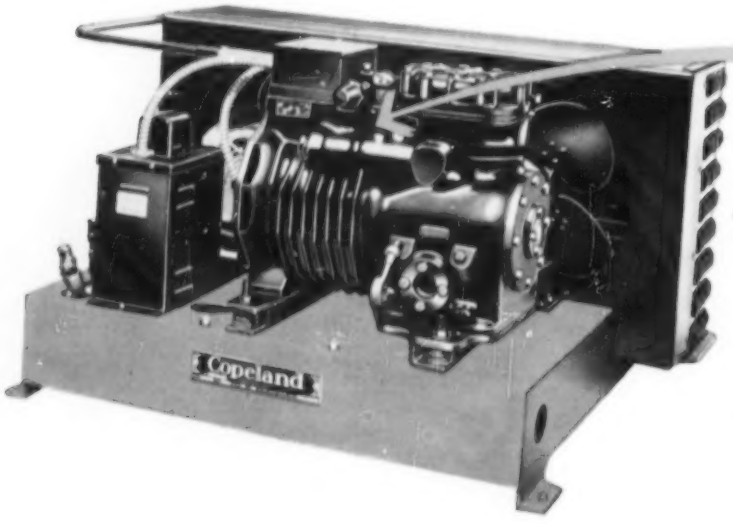

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MODEL ZR-300H
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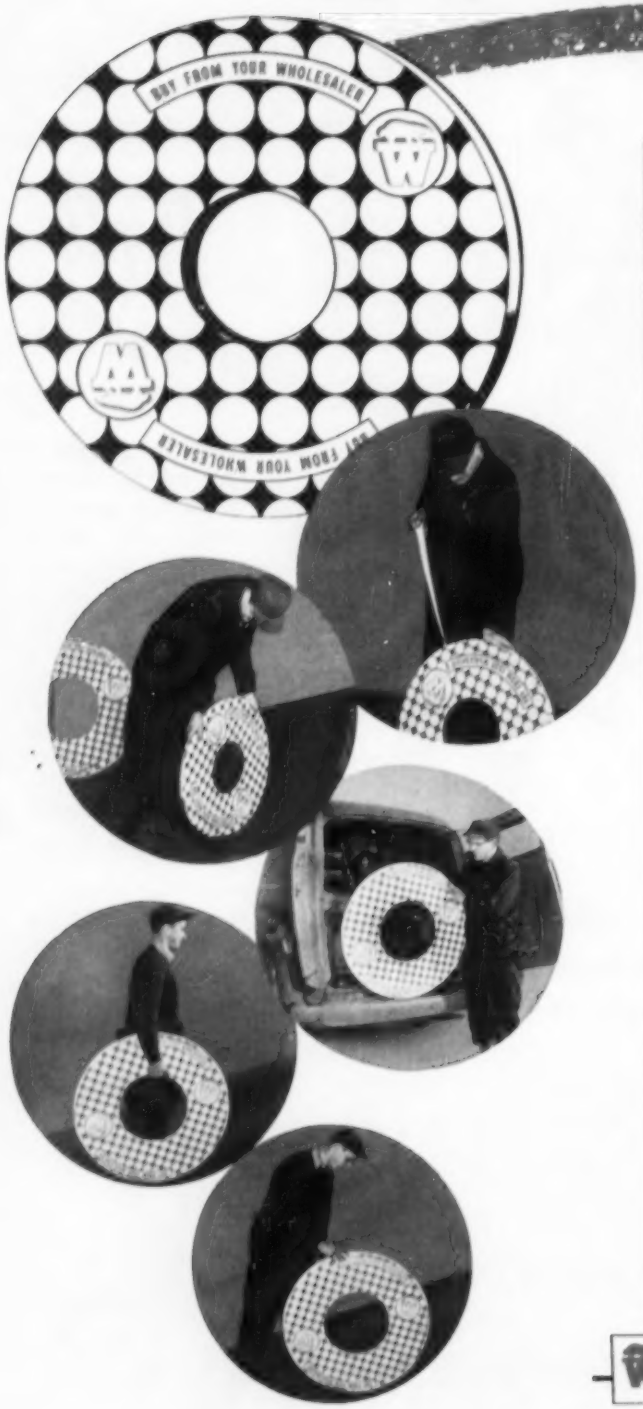

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COMMERCIAL REFRIGERATION & AIR CONDITIONING

JANUARY 1956 • VOLUME 13 • No. 1

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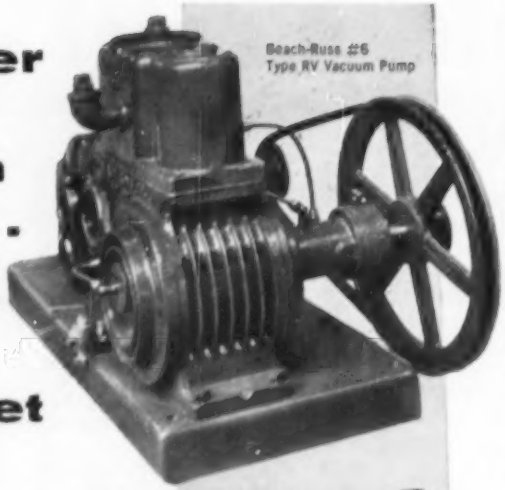
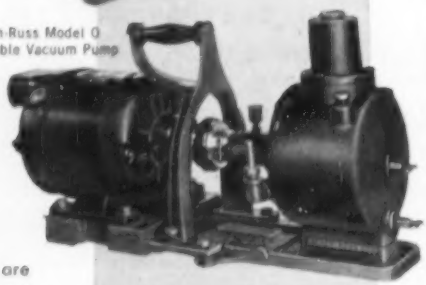


Beach-Russ #6
Type RV Vacuum Pump



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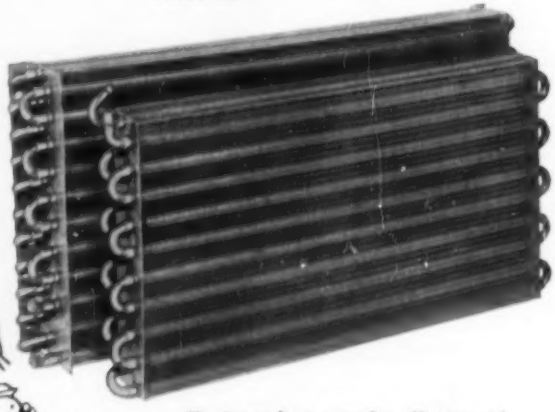

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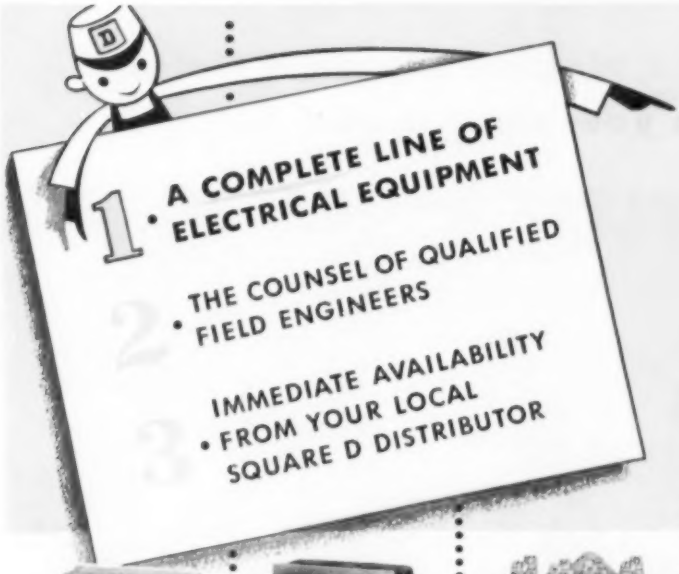

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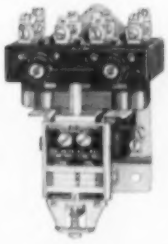
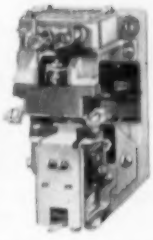


Control Relays

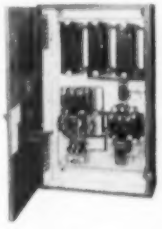
Fractional HP Starters



Timing Relays

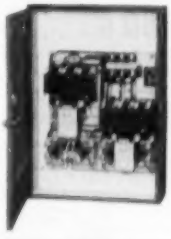
Combination Starters

Panelboards

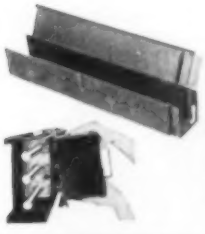


Primary Resistance Type Starters

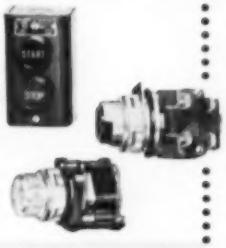
Auto-Transformer Type Starters



Part Winding Type Starters



Wireways and Busways



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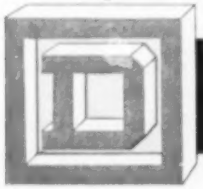

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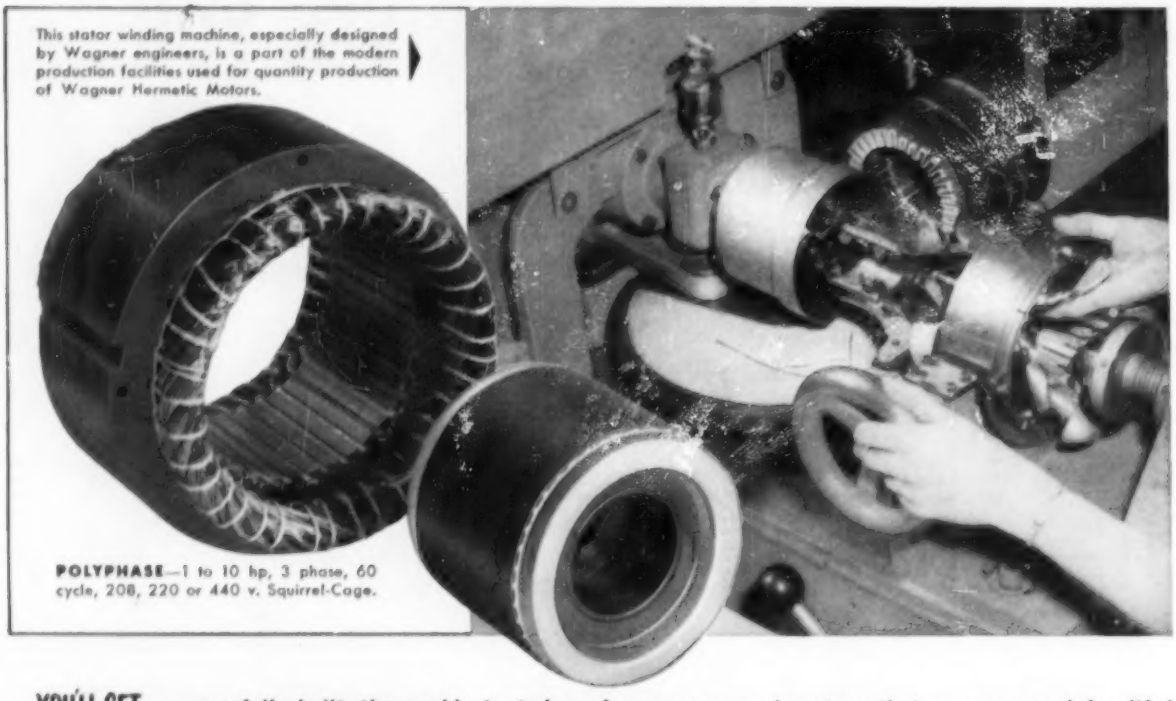

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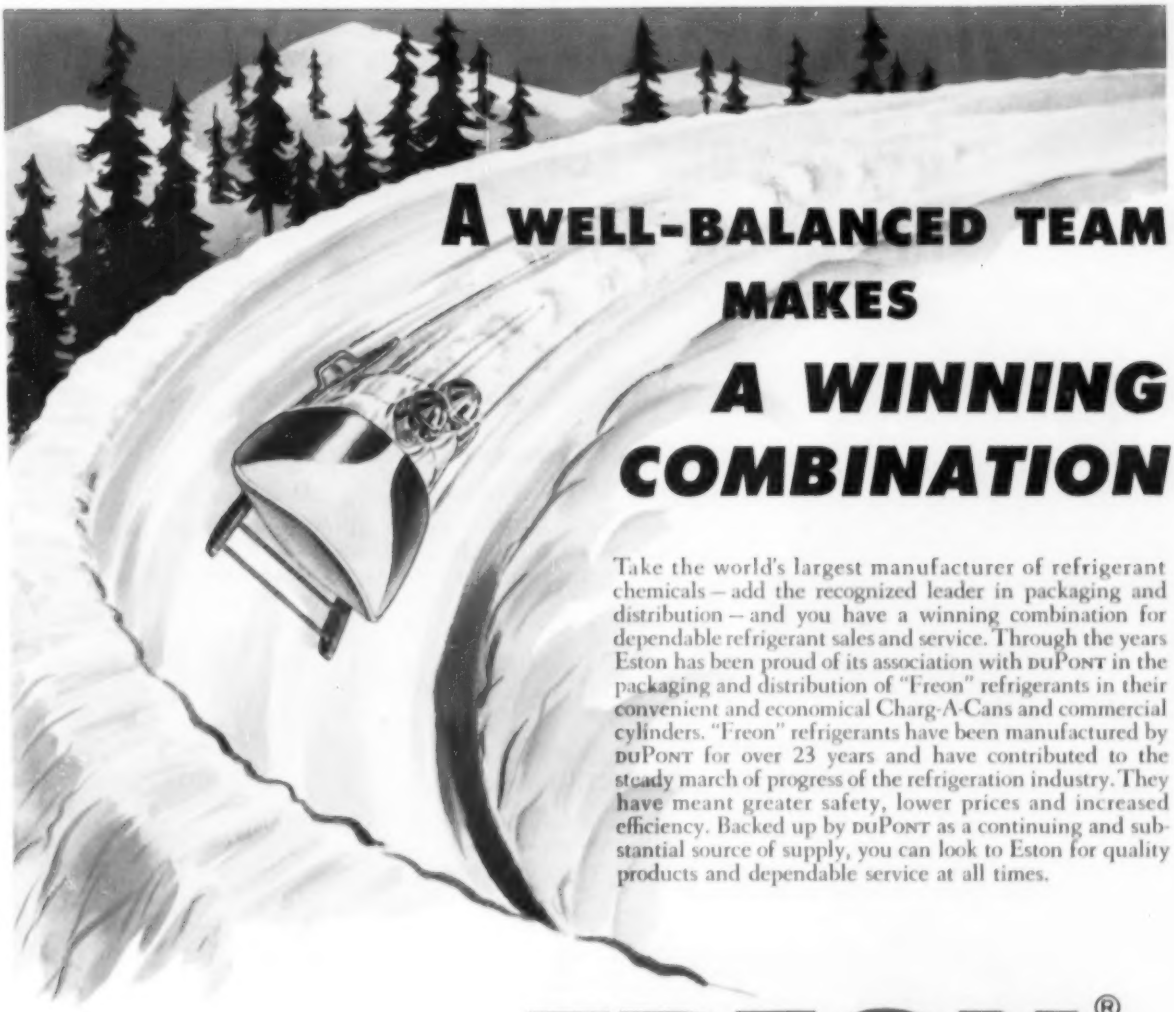

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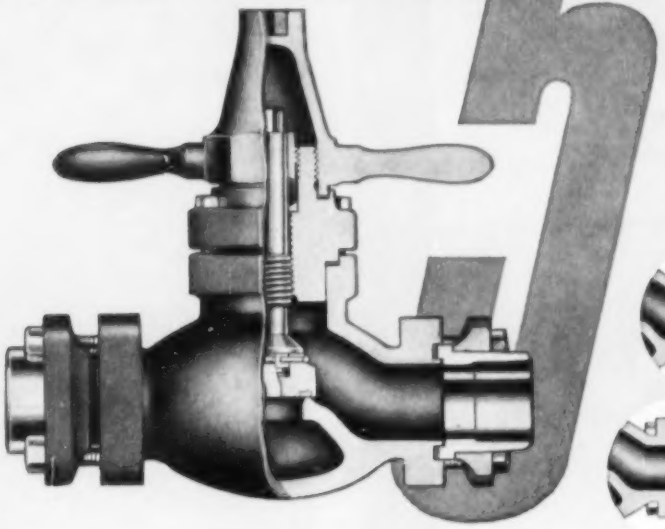

F.P.T.
In Valve Body
½" thru 2½"

O.D. Solder
Brass Adapter
and Steel Flange
1⅜" thru 5⅛"

Steel Butt Weld Adapter
and Steel Flange
1¼" thru 5"

One Piece F.P.T. Flange
1¼" thru 6"

One Piece Slip-on Weld Flange
1¼" thru 6"

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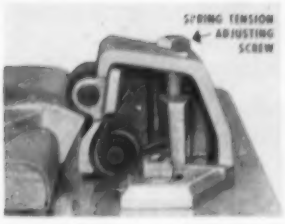
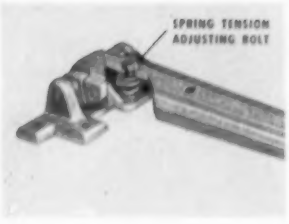
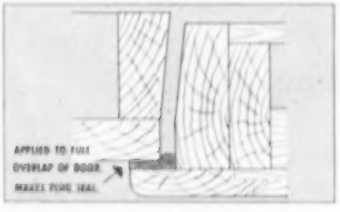
Exclusive JAMISON features make the Series "50" the best buy in cold storage doors





Exclusive JAMISON hardware

- Adjustable hinges and fastener assure tight seal
- Rugged cast construction
- Patented heavy duty design
- Hot dip galvanized finish. Heavy zinc coating gives maximum protection

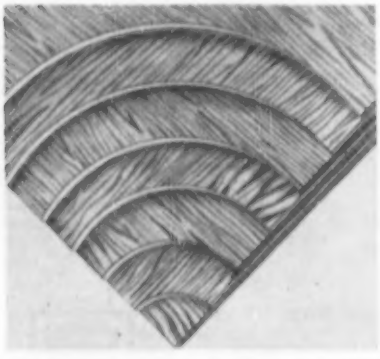


JAMISON gasketing

- Lo-Temp Gasket—soft, resilient with protective jacket
- Sillseal—flexible, abrasion and grease resistant

Box girder construction

- 5 times more rigid—prevents warping—assures tight seal
- Internal bracing eliminated—maximum insulation
- 7 times stronger—extra durability under hard service



Exclusive boat hull plywood

- Finest quality obtainable
- Water-proof plastic bond
- 7-ply front, 5-ply back panel

For complete data on the Jamison Series "50" Door write to Jamison Cold Storage Door Co., Hagerstown, Md. Ask for Bulletin #3.

JAMISON
HAGERSTOWN, MARYLAND, U. S. A.

More JAMISON Doors are used by *more* people than any other Cold Storage Door in the world.

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If your prospect looks like this

suggest time payments

to close the sale

TODAY the demand on working capital is heavy. Preferring to keep their cash and usual lines of credit intact for current operations, more and more of your prospects will want to finance their purchases of equipment. Be sure your proposals are complete by including information about buying on the nationally popular COMMERCIAL CREDIT PLAN. To discover how COMMERCIAL CREDIT'S tailor-made Refrigeration Financing Plan can help you build prestige and close sales, call our office in your city or write COMMERCIAL CREDIT CORPORATION, 14 Light Street, Baltimore 2, Maryland.

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BENDIX-FRIEZ TEMPERATURE-HUMIDITY RECORDER

HELPS YOU DO A BETTER JOB SELLING, INSTALLING AND SERVICING

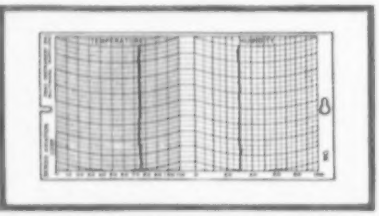
Take the guess work out of air conditioning and refrigeration problems. This Bendix-Friez* Portable Temperature and Humidity Recorder gives you a permanent record of all fluctuations on one chart.

Completely automatic, no wet bulbs, wicks or psychrometric tables required. Spring driven chart moves vertically downward. Built for 10-hour and 30-hour continuous operation.

Used nation-wide by heating, ventilating and air conditioning engineers and servicemen.

Write today for complete information and how this Bendix-Friez instrument can help build business for you.

EASY TO CARRY
Portable as a camera, small enough for an overcoat pocket—ready to go wherever you go. Weighs only 3 lbs. Leather case and strap available at slight extra cost.



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Circle No. 15 on Reader Service Card

It's the LAW!

by Albert Woodruff Gray

Legal problems are an inherent part of operating any business enterprise. If you are beset by them, you'd better talk to your lawyer. This column, which will appear periodically in the issues of COMMERCIAL REFRIGERATION AND AIR CONDITIONING, in no way aspires to serve as legal counsel for our readers. It is prepared, however, by a man well versed in legal practices and opinions, and by presenting digests of actual court cases involving commercial refrigeration and air conditioning dealers and contractors we hope to enable our readers to sidestep some of the legal pitfalls into which they otherwise might unwittingly stumble.

—The Editors

CLAIMS AGAINST PURCHASER OF CONTRACT

UPON the execution of a conditional sale contract for the purchase of an automatic ice machine, the dealer assigned the contract to a bank. After three installments were paid the buyer refused to continue and suit was brought by the bank for the unpaid balance of the account.

In the contract was the provision, "This contract expresses all the terms, conditions and provisions of the agreement between the seller and the buyer and the seller shall not be bound by any representations or warranties made in respect hereof," and the further stipulation, "Undersigned will pay said contract irrespective of any imperfections in the equipment or any breach of alleged representations."

In his defense the purchaser set up a breach of warranty and the bank applied to the court for judgment on the ground that such a defense had been waived by the purchaser under these contract provisions.

In its decision granting the judgment as asked by the bank the court said, "Although there seems to be some conflict of opinion, the general rule seems to be that where a contract of conditional sale is complete on its face and purports to contain the entire contract between the parties, an assignee thereof is not liable to the conditional buyer for a subsequent breach of some independent agreement which, though relating to the goods sold, is not a part of the

contract assigned by the seller. He is not liable in an independent action for such breach nor does such breach furnish the proper counterclaim or defense against the assignee's right to recover on the contract."

Glens Falls National Bank & Trust Co. v. Sansivere, 136 N.Y.S.2d 672, New York.

WARRANTY WAIVED BY BUYER

IN an action brought in Georgia for the foreclosure of a conditional sale agreement in the sale of a refrigerator, the purchaser attempted to set up as a defense the breach of an implied warranty that the equipment was merchantable and reasonably fit for the purpose intended.

It was provided in this contract that, "Seller makes no warranty of the property and purchaser accepts delivery under the warranty, if any, of the manufacturer only." When the trial court refused to consider this defense and held that any implied warranty was waived by this provision, the purchaser appealed.

In its decision the Georgia Court of Appeals referred to a statute of that state that, "A person may waive or renounce what the law has established in his favor when he does not thereby injure others or affect the public interest."

Of the application of this statute to the circumstances in this controversy, the court added, "While the contract sued on expressly stipulates that the seller makes no warranty, the buyer, admittedly having signed the contract, will be deemed to have waived the benefits of the statutory law respecting the implied warranties in sales contracts. Such being the case the provisions quoted clearly exclude as against the sellers, the defense that the property was not reasonably suitable for the purposes intended."

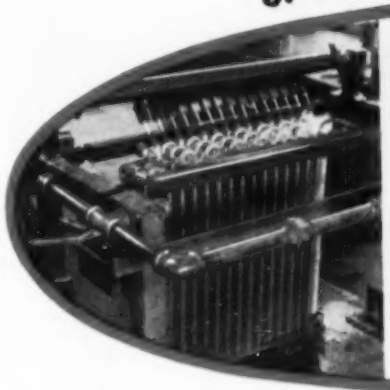
Seigler v. Barrow, 63 S.E.2d 708, Georgia.

PURCHASER WAIVES RIGHT OF REJECTION

REFRIGERATION equipment was installed in a Michigan abattoir under an agreement for the payment of $25,061.05 in installments. When, after six months, only $6,000 was paid, suit was brought by the seller for the balance. To the action the purchaser set up a counterclaim of $150,000 for damages, contending that the equipment was not reasonably fit for beef slaughtering refrigeration and that it had been impliedly warranted as fit for refrigerating 150 head a day of slaughtered cattle.

This equipment however had been used continuously for three years, up to the trial of the action. Under the Uniform Sales Act which has been adopted by the state of Michigan, it

Typical jobs in the busy life of SIL-FOS ... master joiner of non-ferrous metals!



Making room air conditioners with SIL-FOS 5

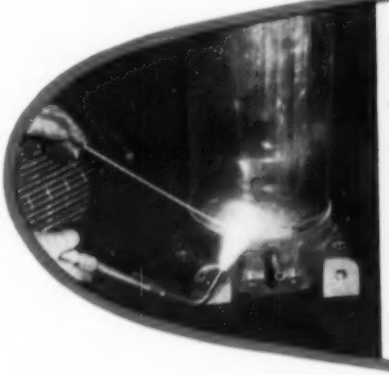
Thousands of SIL-FOS 5 rings are used in assemblying condensers and evaporators of FEDDERS room air conditioners. This low-temperature silver brazing alloy consistently makes the required permanently leak-tight joints. At left – Return bends, assembled on condenser tubes with SIL-FOS 5 rings preplaced, are brazed on city gas-air burner setup – 40 joints in less than 1 minute.

Making copper tanks

After 15 years experience brazing copper tanks with SIL-FOS, the Kam Water Heater Mfg. Co. says: "SIL-FOS proved ideal because it makes high-strength joints at 1300°F. This temperature plus the speed with which this free flowing alloy can be applied, result in a minimum annealing effect on the cold rolled copper we use. In addition, joints are very ductile, thus can withstand pulsation, expansion and contraction."

Making heat exchangers

For over 12 years Kewanee-Ross Corp., Division of American Radiator and Standard Sanitary Corp., have been using SIL-FOS in making ROSS heat exchangers. At left – seamless copper shell is being brazed to cast bronze hub – 31" around – in only 5 to 6 minutes.



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SAW IT... United Corkboard can be trimmed, sawed, nailed just like lumber . . . without splinters or irritating dust.

BEND IT... United Corkboard is flexible. The big, straight-edged slabs fit snugly, take fewer joints. Corners and irregular construction are easy too.

SELF-SUPPORTING... United Corkboard provides structure, framing and insulation all in one . . . requires no internal supports . . . can even be used in self-supporting partitions.

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BONDS TIGHTLY... United Corkboard installs easily with hot or cold asphalt, or other common adhesives. Won't pack down. Resists dampness and formation of moisture carrying channels.

DEMAND UNITED CORKBOARD... for the finest in easy-handling, lightweight, superior-strength insulation. Insure an installation that goes up quickly and easily . . . without added fillers or binders. United Corkboard will not rot, swell, warp or support bacterial growth. It's fire-retardant, insect and vermin-proof.

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Our branch offices provide complete services. Trained engineers are available for consultation . . . or will design every detail of your job. Skilled work crews will erect your installation quickly and efficiently. Almost fifty years of service to the refrigeration industry is your assurance of satisfaction.

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is provided in part that, "The buyer is deemed to have accepted the goods when the goods have been delivered to him and he does any act in relation to them which is inconsistent with the ownership of the seller or when, after a lapse of a reasonable time he retains the goods without intimating to the seller that he has rejected them."

In its decision in favor of the seller the court said, "The purchaser cannot retain the seller's system for such an extended period of time, selling millions of dollars worth of meat refrigerated in the system and avoid liability on the ground that it has not accepted the work and material delivered by the seller.

"If the purchaser chose to retain and use the equipment even though it had given sufficient notice in writing of the rejection, it could not retain possession of the property and use it for its own profit in its business and at the same time insist upon the rejection."

Burge Ice Machine Co. v. Weiss, 219 Fed. 2d 573, Michigan.

MECHANICS' LIEN FOR REFRIGERATION EQUIPMENT

WHEN a dealer after the installation of a refrigeration unit in Costa Mesa, Calif., demanded payment which was not made, he filed notice of a mechanics' lien and started a foreclosure action. In his defense the owner protested that the unit was not material within the meaning of the mechanics' lien law.

In its denial of the dealer's right to a lien the court said, "Electrical refrigerators are somewhat in the nature of machinery and yet something of the quality of furniture. Although they are attached by wires and pipes to the building and may even be placed on specially constructed bases or foundations, they are usually regarded by the trade as chattels.

"It seems quite clear that electrical appliances such as refrigerators and stoves are personal property and do not become a part of the realty where, as here, they are moveable and can be disconnected by merely pulling a plug or unscrewing a gas connection. Under such circumstances we conclude that these units were chattels and not fixtures."

Daniger v. Hunter, 251 Pac. 2d 353, Calif.

DEAN NAMES REP

Dean Products, Inc., has announced the appointment of Ted Stikeleather Sales Co., Cincinnati 18, as its new representative covering Kentucky, Ohio, the southern part of Indiana, and Michigan (except the northwestern and southwestern parts.)

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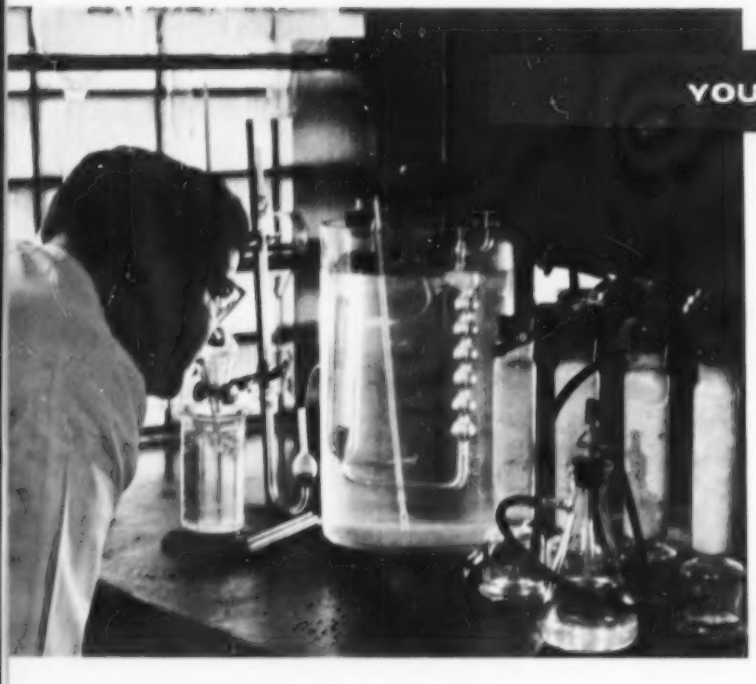
EXPERIENCE
has no competitors

DU PONT FREON® REFRIGERANTS

25 years of growth and service in the air conditioning and refrigeration industry

25 YEARS OF "FREON" REFRIGERANTS

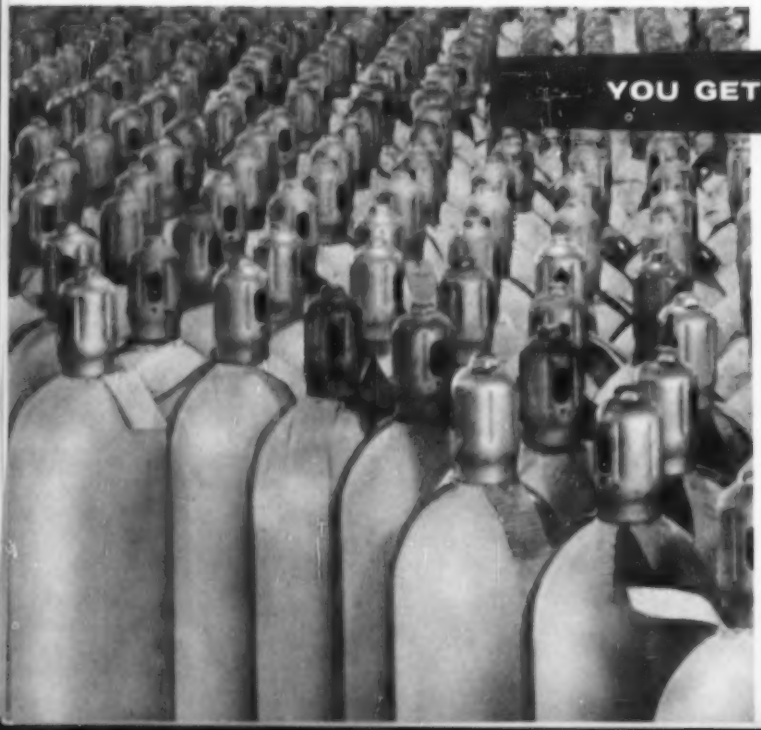
Here's why DU PONT's is vital to your air conditioning



YOU GET SERVICE

Du Pont's record of service has been built over 25 years. Since the introduction of "Freon", Du Pont has provided thermodynamic tables and other engineering data on the properties of "Freon" refrigerants which have been invaluable to designers of refrigerating equipment.

Today, when you buy "Freon", you're not only getting the best refrigerants, but the services of refrigeration specialists as well; laboratory specialists, trained sales engineers and marketing experts who are intimately acquainted with the problems of the refrigeration and air conditioning industry. A letter or phone call can put these men to work for you.



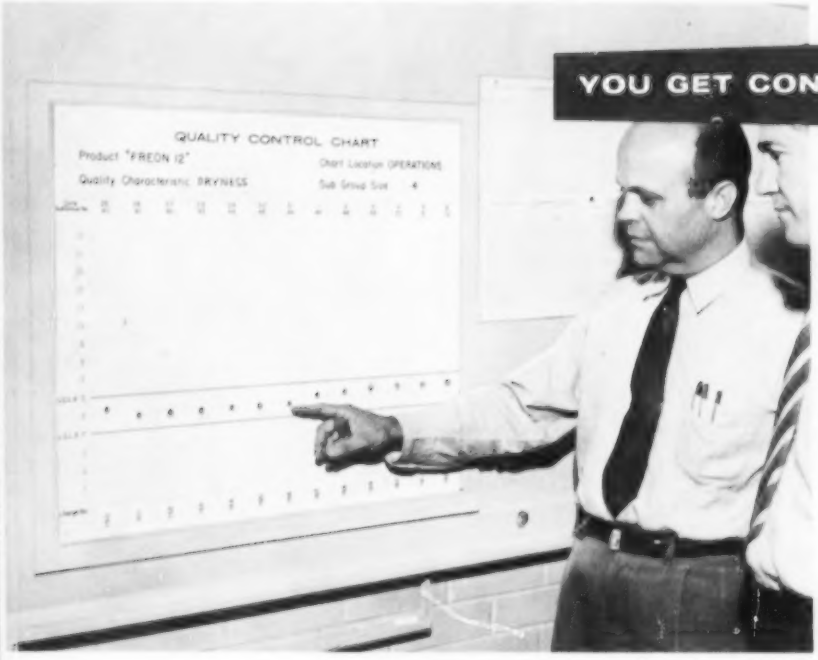
YOU GET A COMPLETE LINE

Today, as over the past 25 years, Du Pont research is at work developing new refrigerants to meet the needs of the air conditioning and refrigeration industry. Now, you can specify a "Freon" refrigerant for any type of installation. Reciprocating, centrifugal or rotary compressors; household, commercial or industrial applications—there's a "Freon" refrigerant for any air conditioning or refrigerating job.

"Freon-11"	**Boiling point 74.8°F.**
"Freon-12"	**Boiling point -21.6°F.**
"Freon-22"	**Boiling point -41.4°F.**
"Freon-113"	**Boiling point 117.6°F.**
"Freon-114"	**Boiling point 38.4°F.**

Be sure to ask your wholesaler for Du Pont "Freon" refrigerants.

quarter century of experience and refrigeration business



YOU GET CONSISTENT HIGH QUALITY

For 25 years Du Pont has made "Freon" refrigerants to the highest quality standards. Today, when you use "Freon" you can be sure it will not give you any trouble from acids or moisture. Du Pont's method of quality control assures that each shipment is *better than the published standards.* Check these refrigerant factors:

1. **Freedom from moisture . . . less than 10 p.p.m.**
2. **Narrow boiling-point range.**
3. **Less than 1.5% noncondensable gases.**
4. **Complete freedom from acids.**
5. **Freedom from high- and low-boiling material.**
6. **Nonflammable, nonexplosive and virtually nontoxic.**

For year after year of trouble-free performance, use Du Pont "Freon" refrigerants.

THE STORY OF "FREON"

During the late 1920's the shortcomings of refrigerants then in use became more and more serious. These refrigerants were difficult to handle, irritating, flammable or toxic. Scientists then set out to find a better refrigerant.

In 1930 tests on a chemical group of fluorinated hydrocarbons showed that they had all the desired properties of an ideal refrigerant. Since 1931, when they were offered for sale as "Freon"* refrigerants, they have played a major part in the growth of the air conditioning and refrigeration industry. Without "Freon", air conditioning could not have achieved the acceptance it has today.

Reserve your free copy of the complete "Story of 'Freon'," a book commemorating the first 25 years of Du Pont "Freon" refrigerants. Mail the coupon or write to E. I. du Pont de Nemours & Co. (Inc.), "Kinetic" Chemicals Division, Wilmington 98, Delaware.

1931 — Experience has no competitors — 1956

1931 KINETIC 1956

25 YEARS OF

"FREON"

SAFE REFRIGERANTS

* "Freon" is Du Pont's registered trademark for its fluorinated hydrocarbon refrigerants

DU PONT

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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
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Please reserve for me a copy of the new book "The Story of 'Freon'."

*Name*_____ *Position*_____

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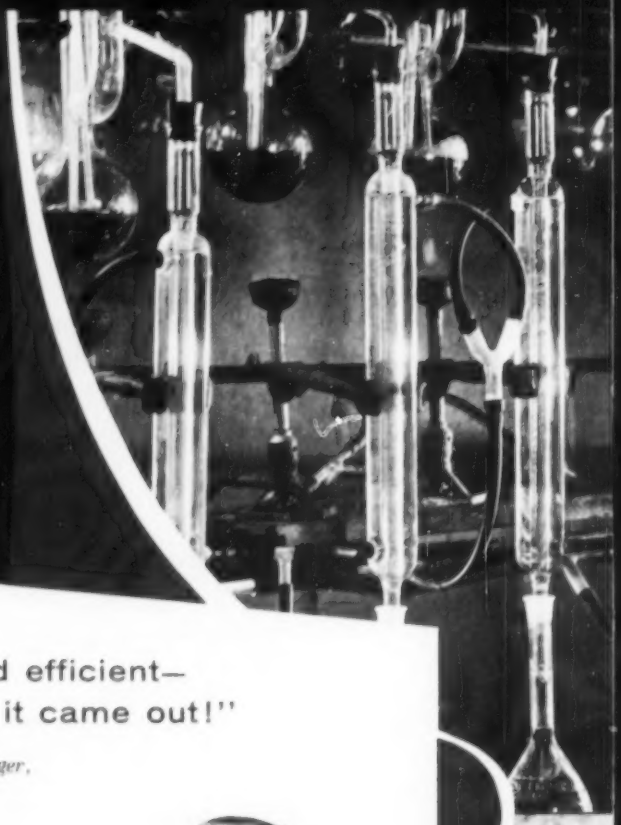
Let these long-time users tell you why you should *always ask for* "FREON"



"'FREON' is 100% safe and efficient—we've used it ever since it came out!"

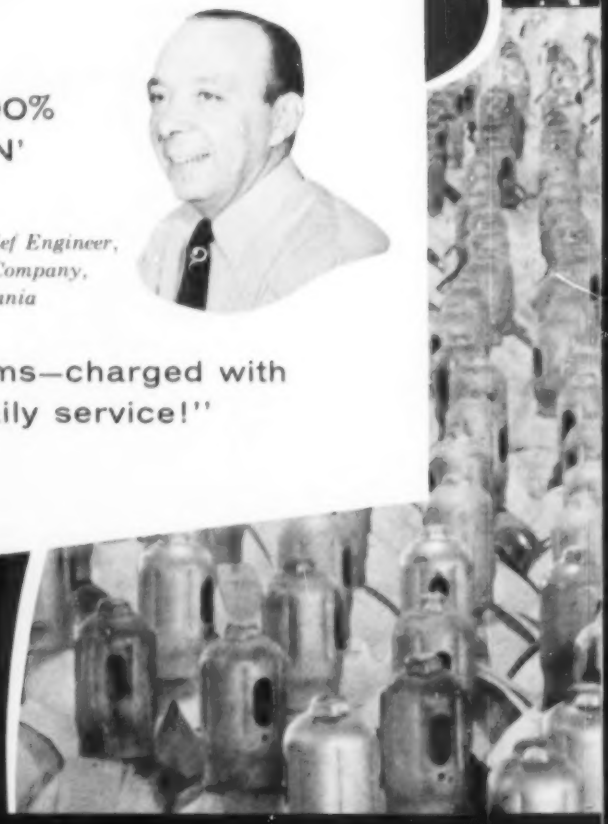
Says Mr. Martin Buschman, Service Manager, Arundel Ice Cream Company, Inc., Baltimore, Maryland

"20 years of use have made me 100% satisfied with the quality of 'FREON' refrigerants!"

Says Morris Silver, Chief Engineer, Republic Air Conditioning Company, Philadelphia, Pennsylvania

"18 years ago I put in systems—charged with 'FREON'—that are still in daily service!"

Says Mr. Karl Becht, Hub Refrigeration Service Company, Bronx, New York



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HERE'S THE RIGHT TOWER FOR THE JOB!

DOVER Complete Line of Packaged Cooling Towers

Whatever your cooling tower needs, now there is a Dover packaged cooling tower that's just right for the job. From 2 to 100 tons capacity, the complete line of Dover towers is America's new standard in packaged cooling towers.

Here is quality at a competitive price! While Dover towers are priced among the lowest in the industry, when you consider all the features you get only in a Dover tower, they are actually less expensive than others.

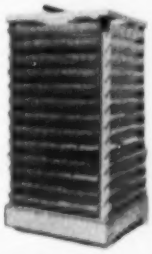
A TOWER FOR EVERY NEED . . . A NEED FOR EVERY TOWER!

VERTICAL INDUCED DRAFT TOWER
with Centrifugal Blower—Series V

Ideal where space is limited. Install this compact tower anywhere in the building. Piping requirements are at a bare minimum. Super-quiet operation lets you place it in rooms close to workers—and it will ventilate the room that it is in. From 5 to 100 tons.

HORIZONTAL INDUCED DRAFT TOWER
with Propeller Fan—Series CF

A compact unit with all the design and construction features that you have been looking for in a packaged tower. Neat in design, rugged in construction, it is ideally suited for small air conditioning and refrigeration installations and for jacket water or air compressor cooling. From 2 to 100 tons.



NATURAL DRAFT TOWERS
In Steel & Redwood—Series S—or All Steel Construction—Series K

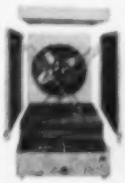
Take your pick from either the new all-steel construction or the somewhat lower-priced redwood and steel construction. Both have the exclusive Dover bolt-free principle for quick, easy installation. Two men can erect some sizes in just 20 minutes. From 3 to 100 tons.

LOOK AT THESE BONUS FEATURES YOU GET ONLY IN DOVER TOWERS!

HOT-DIP GALVANIZING
all metal parts on all Dover towers are hot-dip galvanized after fabrication. This costs you nothing extra, yet saves you a lot by stopping costly rust and corrosion problems.

STAINLESS STEEL FANS
. . . and shafts are standard equipment on all Dover Series CF towers, providing you with years of trouble-free performance. Built to last.

"TAKE-APART" FEATURE
is another Dover exclusive! By virtually eliminating bolts, Dover towers can be quickly taken apart and reassembled where basement or rooftop locations make this desirable.



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Two Powerful New Sales

A New Brunner-Metic Warranty . . . with

If you MANUFACTURE . . . or SELL . . . or SERVICE it's the most simple . . . most complete . . . most satisfactory WARRANTY PROGRAM in the industry

Here is a Semi-Hermetic WARRANTY PROGRAM that really *protects* and *serves* the customer—yet is easily *workable* and *profitable* to the trade!

BRIEFLY, HERE'S HOW IT WORKS:

1 **Standard One-Year Warranty** — Every Brunner-Metic customer is *automatically* protected by the Brunner-Metic "STANDARD ONE-YEAR WARRANTY." This warranty covers the *complete* unit and warrants *any part* of the unit against defects in material or workmanship occurring one year from installation date. No action by the manufacturer, customer or his agent is necessary to place the STANDARD ONE-YEAR WARRANTY in effect.

2 **Five Year Protection Policy** — When a customer or his service agent applies for and purchases Brunner-Metic Five Year Protection Policy, then complete unit is protected for *first* year exactly as with Standard One-Year Warranty — and motor-compressor part is protected for *four* additional years.

3 Cost of Brunner-Metic Five Year Protection Policy is based upon H.P. of unit involved.

4 Customer, through his service agent, contacts his *nearest* Brunner-Metic wholesaler when replacement or repair of parts in warranty is necessary. Wholesaler will accept the part and *sell* new replacement part, from stock, at Exchange Price, plus freight. No red tape — no waiting for parts to come from factory!

5 If part is found defective under terms of warranty, Brunner refunds full credit and freight allowance for part exchanged to wholesaler — who credits service representative. Wholesaler is compensated by Brunner under terms of Warranty Agreement. Result: free replacement at Wholesaler's place of business.

FOR COMPLETE DETAILS, SEND FOR YOUR FREE COPY OF NEW BOOKLET

WHAT THIS BRUNNER-METIC WARRANTY MEANS:

TO THE CUSTOMER:

FASTER SERVICE on replacement parts covered by warranty — regardless of origin of purchase of unit, nearest Brunner-Metic Wholesaler handles warranty transaction . . . F.O.B. his location. SAVES MONEY: customer saves on Brunner policy of paying freight both ways . . . on outgoing defective part and incoming replacement to wholesaler.

TO THE MANUFACTURER:

Greater customer confidence that leads to greater sales — because Brunner-Metic unit is backed by a sound, workable warranty. The Brunner-Metic unit in your product becomes a *vital* sales asset! If you carry your own warranty you can still utilize Brunner-Metic's nationwide warranty exchange program.

TO THE SERVICE REPRESENTATIVE:

The Brunner-Metic Warranty means *satisfied* customers — because you can give them the *fast action* they want when replacements in warranty are justified! Less work for you, too — you deal only with *nearby* Brunner-Metic wholesaler — *not* direct with factory!

Circle No. 20 on Reader Service Card

Features by BRUNNER SINCE 1906

parts depots across the nation

50th Anniversary BRUNNER — PROVEN QUALITY · DEPENDABLE

The Brunner-Metic Warranty is backed and serviced by these Progressive Refrigeration Wholesalers

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Birmingham Budlock Refrig. Sup. Co.
Montgomery ..... Nolin-McInnis Co.

ARKANSAS
Fort Smith ..... Central Supply Co.
Little Rock .. Refrig. & Elec. Sup. Co.

ARIZONA
Phoenix ..... Authorized Sup. Co.
Phoenix, State Equip. & Sup. Co., Inc.

CALIFORNIA
East Los Angeles .. Arrow-Risco, Inc.
El Centro .. Allied Refrig. Sup., Inc.
Fresno .... California Refrigerator Co.
Glendale ..... Arrow-Risco, Inc.
Long Beach
L. B. Marsh Allied Refrigeration Co.
Los Angeles ..... Arrow-Risco, Inc.
Los Angeles ..... Brea Supply Co.
Los Angeles .. Thermal Products, Inc.
Oakland ..... Cole Refrigerator Co.
San Bernardino
L. B. Marsh Allied Refrigeration
San Diego .. Allied Refrig. Sup., Inc.
San Francisco .. California Refrig. Co.
San Francisco .. Refrig. & Power Spec.
San Gabriel ..... Arrow-Risco, Inc.
Stockton ..... Refrig. & Power Spec.

COLORADO
Denver ..... Thermo Supply Co.

CONNECTICUT
Hartford ..... N. W. Day Sup. Co.
Hartford ..... Joseph Simons Co.
New Haven ..... Resco, Inc.

DISTRICT OF COLUMBIA
Washington
Refrigeration Supply Co., Inc.

FLORIDA
Jacksonville .... Hajoca Corporation
Jacksonville ..... Refrig. Supply Co.
Miami ..... Bowen Refrig. Sup., Inc.
Orlando .... R & R Supply Co., Inc.
Pensacola .. Cooling & Heating Sup.
Tampa ..... Hajoca Corporation
Tampa
Leo S. Bosarge Co. of Tampa, Inc.

GEORGIA
Atlanta .... Leo S. Bosarge Co., Inc.
Atlanta Bowen Refrig. Supplies, Inc.
Columbus ..... Hajoca Corporation
Macon .... Graves Refrigeration, Inc.
Savannah Savannah Refrig. Sup. Co.

ILLINOIS
Chicago ..... Service Parts Co.
Decatur ..... Potter Supply Co.
Peoria ..... Polar Supply Corp.
Springfield R. H. Spangler Co., Inc.

INDIANA
Evansville Budlock Refrig. Sup. Co.
Evansville Ohio Val. Hdwe. Co., Inc.
Indianapolis .. Duncan Supply Co.
Mishawaka .... Valley Equipment Co.
Richmond .... Gennett & Sons, Inc.

IOWA
Cedar Rapids ..... Thermal Co., Inc.
Des Moines ..... Thermal Co., Inc.
Davenport .. White Refrig. Sup., Inc.

KANSAS
Topeka ..... Refrigeration Equip. Co.
Wichita ..... Refrigeration Equip. Co.

KENTUCKY
Lexington ..... Brock-McVey Co.
Louisville .. Mill Industrial Sup., Inc.

LOUISIANA
Baton Rouge .... Acme Refrigeration
Lafayette
Cooling & Heating Wholesalers
Lake Charles .. Temtrol Supply, Inc.
New Orleans Enochs Sales Co., Inc.
Shreveport
Standard Brass & Mfg. Co.

MAINE
Portland ..... A. E. Borden Co., Inc.
Portland ..... Joseph Simons Co.

MARYLAND
Baltimore ..... Roche & Hull, Inc.
Salisbury ..... Roche & Hull, Inc.

MASSACHUSETTS
Boston ..... A. E. Borden Co., Inc.
Springfield .. C. P. Payson Co., Inc.

MICHIGAN
Alpena .. J. Geo. Fischer & Sons, Inc.
Detroit .. J. Geo. Fischer & Sons, Inc.
Grand Rapids ..... Harris Supply Co.
Jackson .. J. Geo. Fischer & Sons, Inc.
Kalamazoo ..... Harris Supply Co.
Lansing ..... Harris Supply Co.
Saginaw .. J. Geo. Fischer & Sons, Inc.

MINNESOTA
Minneapolis ..... Thermal Co., Inc.
St. Paul ..... Thermal Co., Inc.

MISSISSIPPI
Jackson ..... Paine Supply Co.
Meridian ..... Motor Supply Co.

MISSOURI
Kansas City Refrigeration Equip. Co.
St. Louis R. H. Spangler & Co., Inc.

NEBRASKA
Lincoln ..... Wickham Sup. Co., Inc.
Omaha White Refrigeration Sup., Inc.

NEVADA
Las Vegas L. B. Marsh Allied Refrig.
Reno ..... Acme Supply & Equip. Co.

NEW JERSEY
Avon-by-the-Sea Wallwork Bros., Inc.
Newark ..... Tesco Distributors
Newark ..... Wallwork Brothers, Inc.
New Brunswick .. Tesco Distributors
Ocean Grove .... Tesco Distributors
Trenton ..... Jaegers Sales & Service
Union City ..... Tesco Distributors

NEW YORK
Albany .. R. D. Marshall & Co., Inc.
Brooklyn Excel Refrig. Supplies, Inc.
Buffalo W. A. Case & Son Mfg. Co.
Buffalo .... Jordan Supply Company
Elmira ..... Brady Supply Company
Mount Vernon .. Eastern Supply Co.
New York .. Aetna Supply Company
New York ..... Albert Hofeld, Inc.
New York
Reese & Long Refrig. Prod., Inc.
New York Paramount Elec. Sup. Co.
Rochester .. Ontario Metal Sup., Inc.
Syracuse Empire Refrig. Sup. Co., Inc.
Syracuse W. A. Case & Son Mfg. Co.
Utica ..... Vaeth Electric Company

NORTH CAROLINA
Asheville ..... Hajoca Corporation
Charlotte .... Bowen Refrig. Supplies
Charlotte ..... Henry V. Dick & Co.
Durham ..... Hasco, Inc.
Greensboro ..... Hasco, Inc.
Raleigh ..... Noland Co., Inc.
Raleigh ..... Henry V. Dick Co., Inc.
Wilson ..... Noland Co., Inc.
Winston-Salem ..... Hasco, Inc.

OHIO
Akron ..... Davey Sales Company
Cincinnati .. Mutual Mfg. & Sup. Co.
Cleveland
Cleveland Hermetic & Sup. Co., Inc.
Columbus ..... Mason Supply Co.

OKLAHOMA
Oklahoma City
Jones-Newby Supply Co.
Oklahoma City .. M & V Supply Co.
Tulsa ..... Jones-Newby Supply Co.

OREGON
Portland Refrig. & Power Specialties

PENNSYLVANIA
Allentown ..... Larson Supply Co.
Erie ..... W. A. Case & Son Mfg. Co.
Harrisburg ..... Resco, Inc.
Philadelphia ..... Acar Supply Co.
Pittsburgh ..... Orr, Inc.
Pittsburgh ..... Proie Brothers, Inc.
Reading ..... Larson Supply Co.
Scranton Central Service Supply Co.
Wilkes-Barre ..... Radio Service Co.

RHODE ISLAND
Providence .. R. I. Refrig. Supply Co.

SOUTH CAROLINA
Columbia .... H. V. Dick & Company
Columbia ..... Noland Co., Inc.
Greenville .... Henry V. Dick & Co.

SOUTH DAKOTA
Sioux Falls ..... Thermal Co., Inc.

TENNESSEE
Chattanooga ..... Peglar's Inc.
Memphis .... R. H. Spangler Co., Inc.
Nashville .... J. B. Thomas Company

TEXAS
Abilene ..... C & H Distributing Co.
Corpus Christi
S. Texas Refrig. Supply Co.
Dallas Barbeck Refrig. Sup. Co., Inc.
Dallas ..... Climate Supply Co.
El Paso M & M Refrig. & Elec. Sup.
Fort Worth Texas Refrig. Supply Co.
Harlingen ..... United Supply Co.
Houston ..... Johnson Supply Co.
Houston ..... Lingo Company, Inc.
Houston Standard Brass & Mfg. Co.
Lubbock R & R Refrig. Corporation
San Antonio ..... United Supply Co.
San Antonio .. Westbrook Company
Tyler ..... Amstan Supply Division
Waco ..... Texas Refrig. Supply Co.

UTAH
Salt Lake City Commercial Dist. Co.

VERMONT
Burlington .. Blodgett Sup. Co., Inc.

VIRGINIA
Bristol ..... Southern Refrig. Corp.
Newport News ..... Noland Co., Inc.
Norfolk ..... Noland Co., Inc.
Norfolk ..... Refrig. Suppliers, Inc.
Roanoke .... Southern Refrig. Corp.

WASHINGTON
Seattle .. Refrig. & Power Spec. Co.
Spokane ..... Wakefield Supply Co.
Tacoma .. Refrig. & Power Spec. Co.

WEST VIRGINIA
Charleston ..... Mason Supply Co.
Huntington .. Mech. Refrig. Sup. Co.
Wheeling ..... Mason Supply Co.

WISCONSIN
Madison B.T.U. Equip. & Sup. Corp.
Milwaukee ..... Thermal Co., Inc.

"THE BRUNNER-METIC WARRANTY PROGRAM"

TO THE WHOLESALER:

The Brunner-Metic Warranty Program Protects your interests—and your profit—through a fair, equitable compensation plan for you. And the good will generated by prompt satisfaction of warranty claims results in more sales for you.

GET THE COMPLETE STORY . . .

See your Brunner Man—or write us today for full information on this terrific business-building warranty!

Mail This Coupon TODAY for Free Booklet on BRUNNER-METIC WARRANTY

THE BRUNNER COMPANY, Dept. C-156 GAINESVILLE, GA.

I am interested in full details on Brunner-Metic Warranty Program

☐ Please send booklet
☐ Please have representative call

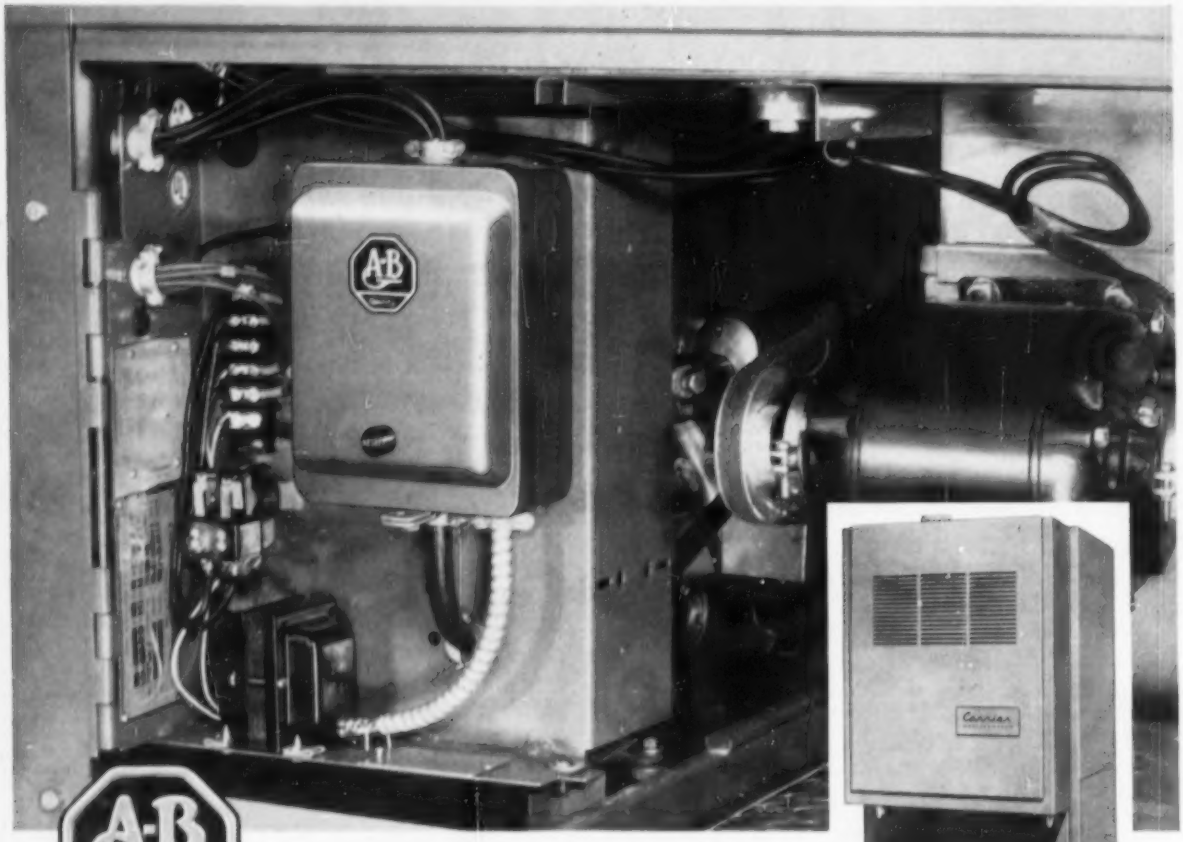
Name .....
Firm .....
Address .....
City ..... State .....

☐ Manufacturer ☐ Service-Dealer ☐ Wholesaler

Circle No. 20 on Reader Service Card

Carrier *Weathermaker Air-Conditioning Units*

operated by **ALLEN-BRADLEY TROUBLE FREE MOTOR CONTROLS**



A-B Quality

The Sign of Quality Motor Control

Carrier Weathermaker No. 38C air conditioner for residential use

Typical Allen-Bradley Quality Motor Controls

Bulletin 736 Part Winding Motor Starter

Bulletin 640 Manual Resistance Type Starter

Bulletin 746 Automatic Auto-transformer Type Starter

To obtain reliable service year after year, from an air-conditioning or refrigeration unit, it must be equipped with a starter built to "take it". . . and over the last 25 years Allen-Bradley Bulletin 709 solenoid starters have established their reputation for dependable operation.

This performance is due to the simplest starter mechanism yet conceived . . . the solenoid switch with only ONE moving part. No pins, pivots, or bearings to corrode and bind . . . no jumpers to break. The cadmium silver alloy contacts never require troublesome cleaning, filing, or dressing.

In addition, Allen-Bradley Quality Motor Controls have these "plus" values . . . overload relays that retain their accuracy irrespective of time or operating conditions . . . highly efficient magnetic circuits that hold through wide voltage fluctuations . . . white interiors that make for easier wiring in dark locations. Specify Allen-Bradley . . . for millions of trouble free operations.

Complete information on Allen-Bradley Quality controls is contained in the A-B Handy Catalog . . . an abbreviated encyclopedia on motor control. Write for your copy, today.

Allen-Bradley Co.
1340 S. Second St., Milwaukee 4, Wis.
In Canada—
Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

Circle No. 24 on Reader Service Card

here are the
INSIDE FACTS
about the
NEW IMPROVED SPORLAN SOLENOID VALVES
with the

POWER PACKED
Blue Seal
COIL

Sporlan
BLUE SEAL COILS
give
PEAK PERFORMANCE
because

1. Extra winding provides reserve protection against burn out.
2. Layer wound magnet wire, plus cotton thread spacing affords maximum insulation.
3. Twice dipped varnish and baking provides complete impregnation.
4. Final protective Blue Seal dip and bake assures moisture-proof seal.

SPORLAN

For Peak Performance on all installations... buy Sporlan Solenoid Valves with the New Power Packed Blue Seal Coil... better still, Buy Sporlan Right Down the Line!

SPORLAN ENGINEERING FEATURES INCLUDE:

Extremely simple design — Few Parts... Sturdy — Take apart construction... Floating type stem and plunger assembly... Tight Closing — Pin and seat polished to a super finish... All large capacity pilot piston operated solenoid valves are equally applicable to both Freon-12 and Freon-22... Tighter closing is assured — New synthetic seating now available in Types - 43 - 53 and 73... Interchangeability of Coils — One size Blue Seal Coil fits 5 different type valves... All sweat type connection valves are now delivered hand tight — saves valuable time in removing internal parts before applying valves to the system... A new universal mounting bracket for all Sporlan Solenoid Valves.

SPORLAN VALVE CO.
7525 SUSSEX AVENUE ST. LOUIS 17, MO.
EXPORT DEPARTMENT: 89 BROAD STREET, NEW YORK 4, N. Y.

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YOU ARE CHOSEN...

because you qualify!

Do you know why most of you get this magazine without charge? How can the publisher afford to send you this leading magazine every month — without cost to you? Here's why . . .

Advertisers insist on

Quality Readership

It's that simple!

Your local refrigeration and air conditioning wholesaler pays us for your subscription to COMMERCIAL REFRIGERATION & AIR CONDITIONING because he knows you merchandise, sell, install or service refrigeration and air conditioning equipment; because he knows you are responsible for specifying and/or buying this kind of equipment. Naturally, he is willing to spend this kind of money only on the best and most important people in his territory.

COMMERCIAL REFRIGERATION & AIR CONDITIONING readers are **hand-picked.** They are important people in the refrigeration and air conditioning business — they are carefully chosen because of their interest in new and better air conditioning and refrigeration products, equipment and techniques.

This type of circulation is called

Franchise Circulation

That's why — COMMERCIAL REFRIGERATION & AIR CONDITIONING spends considerable time, money and effort on every issue to make it worthwhile reading — realistically helpful, intelligently interesting and useful to our 25,000 **important readers.**

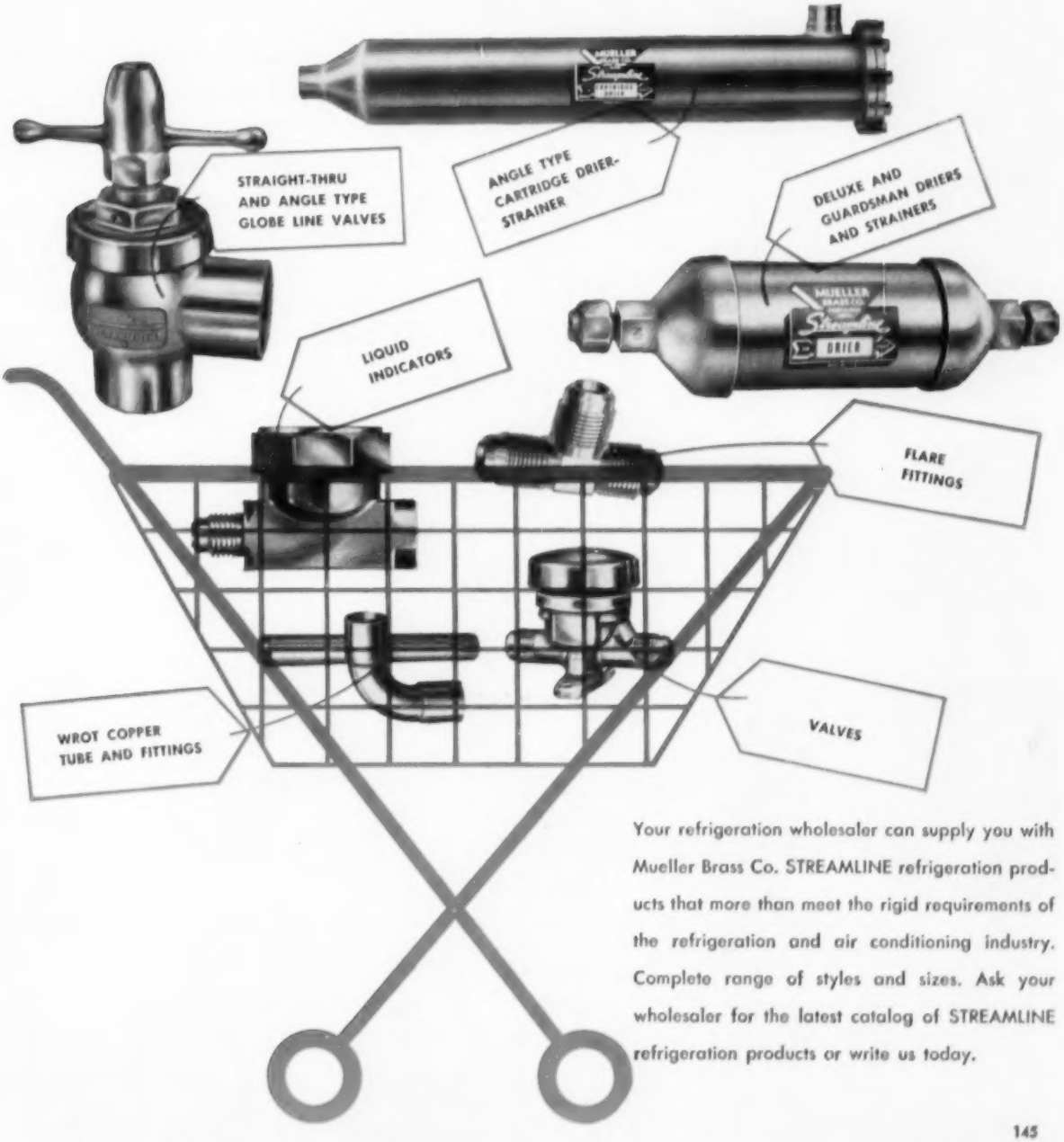
FRANCHISE CIRCULATION

Commercial Refrigeration & Air Conditioning

1248 ONTARIO STREET CLEVELAND 13, OHIO

ONE STOP SHOPPING
FOR ALL REFRIGERATION PRODUCTS

MUELLER BRASS CO. MANUFACTURES A COMPLETE LINE OF VALVES, DRIERS, FITTINGS AND ACCESSORIES FOR EVERY NEW COMMERCIAL INSTALLATION AND EVERY REPLACEMENT NEED . . .



Your refrigeration wholesaler can supply you with Mueller Brass Co. STREAMLINE refrigeration products that more than meet the rigid requirements of the refrigeration and air conditioning industry. Complete range of styles and sizes. Ask your wholesaler for the latest catalog of STREAMLINE refrigeration products or write us today.

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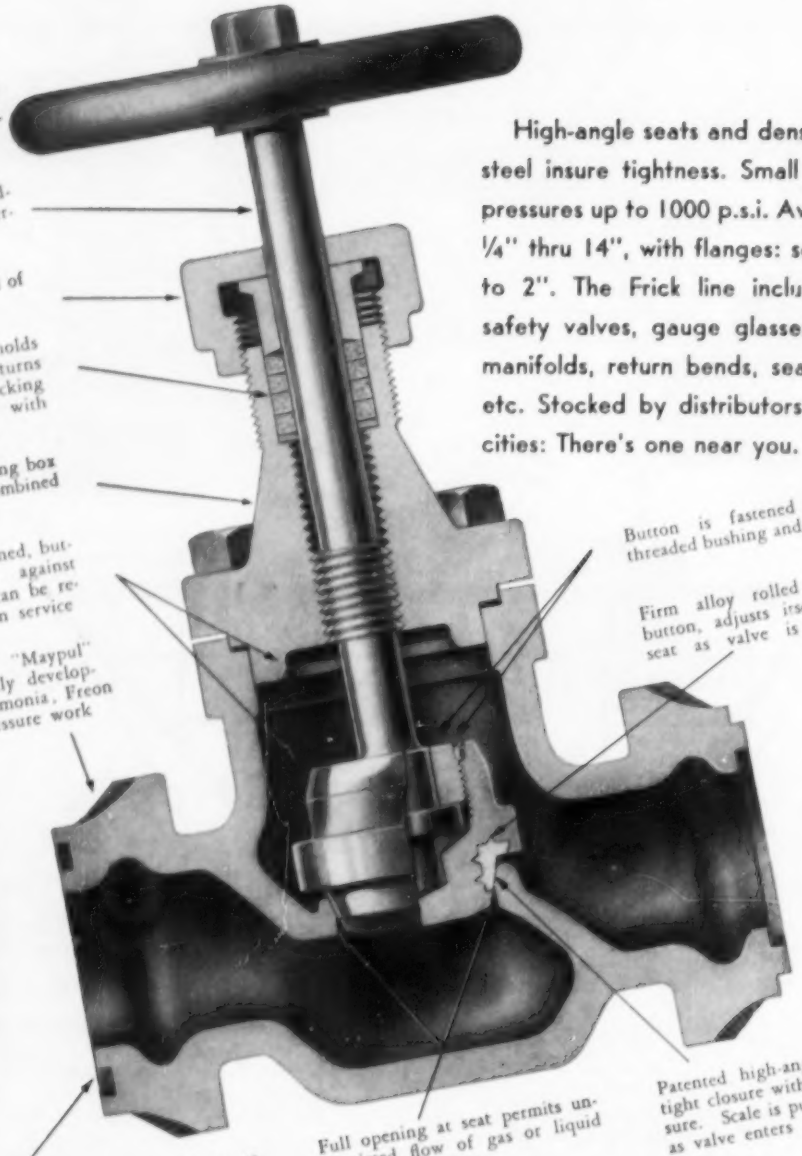
MUELLER BRASS CO. PORT HURON 10, MICHIGAN

Circle No. 23 on Reader Service Card

FRICK Valves are Superior for Ammonia, Freon and other High-Pressure Services


Large hand wheel secured to squared end of stem
Long valve stem of cold-rolled steel, made oversize for strength
Packing nut and gland of rugged construction
Ample packing holds pressure while stem turns freely. Special packing supplied for use with Freon refrigerants
Usual collar, stuffing box and bonnet are combined into one piece
When fully opened, button back-seats against bonnet; valve can be repacked while in service
Castings of "Maypul" steel, especially developed for ammonia, Freon and high-pressure work
Button is fastened by threaded bushing and pin
Firm alloy rolled into button, adjusts itself to seat as valve is used.
Flanges of standard sizes, to match other fittings. Screwed valves also available in sizes up to 2"
Full opening at seat permits unrestricted flow of gas or liquid through the valve
Patented high-angle seat insures tight closure with minimum pressure. Scale is pushed off the seat as valve enters

High-angle seats and dense "Maypul" steel insure tightness. Small valves hold pressures up to 1000 p.s.i. Available from ¼" thru 14", with flanges: screwed sizes to 2". The Frick line includes fittings, safety valves, gauge glasses, one-piece manifolds, return bends, seal-caps, etc., etc. Stocked by distributors in principal cities: There's one near you.

Catalog O Gives Sizes, Symbol Numbers, Dimensions and Weights of Valves, Fittings and Accessories. Get Your Copy Now

See the Frick Exhibit in Booth 623 at the A.R.I. Exposition, Atlantic City

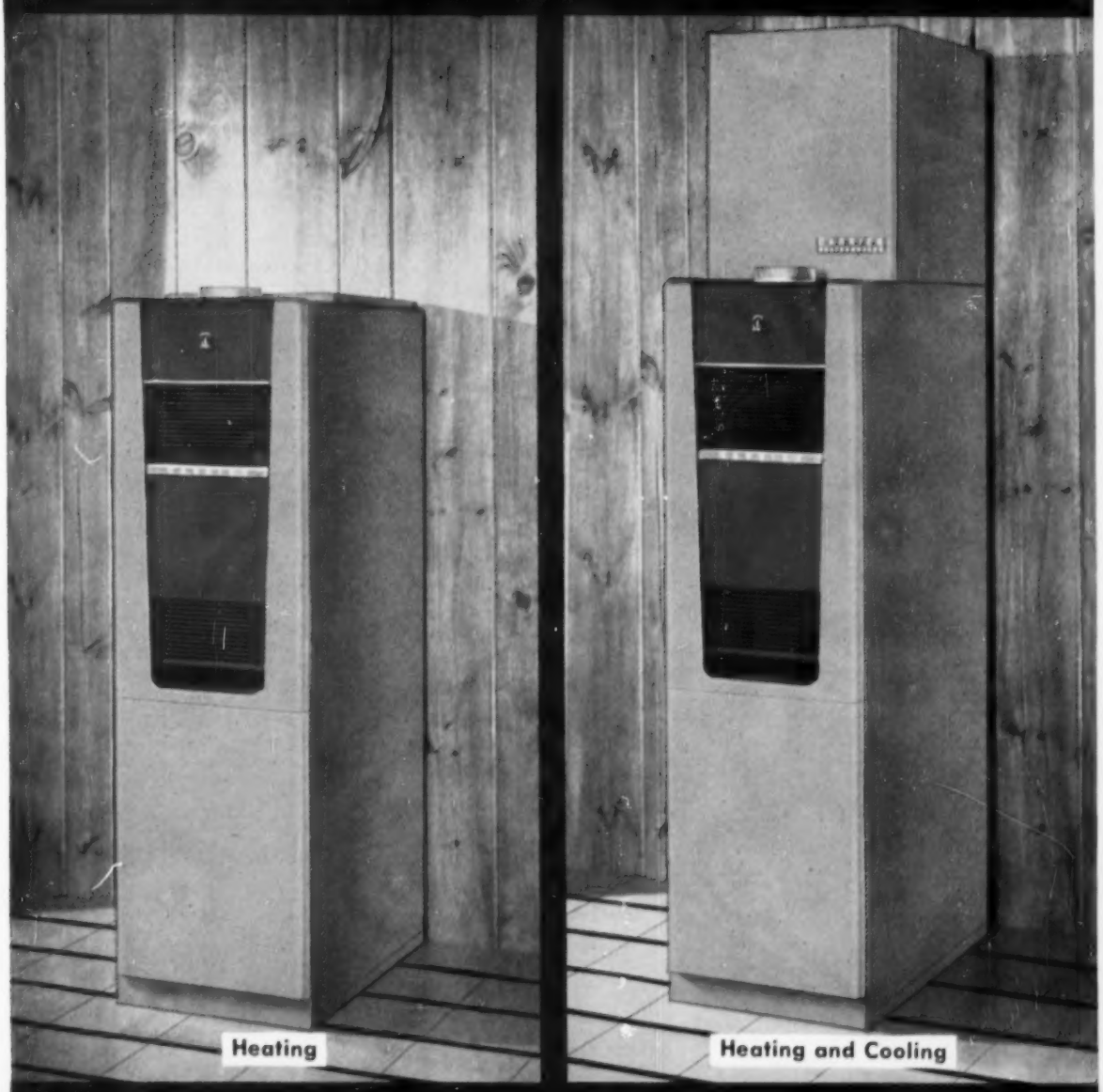
DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA. U.S.A.

Circle No. 21 on Reader Service Card

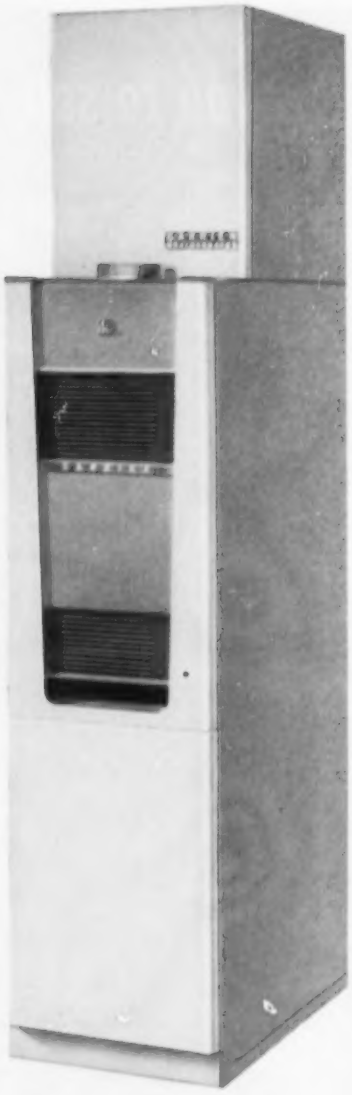
Now there are Carrier furnaces for you to sell, too!



THE NEW CARRIER WINTER WEATHERMAKER

...the furnace with a future ⟶

Circle No. 26 on Reader Service Card



Newest additions to line will give you

Carrier furnaces will end dealers' slack months

With these new Winter Weathermakers, Carrier brings you a 365-day-a-year busy season. As a Carrier dealer there isn't a home heating or cooling problem you can't solve. To begin with, there's a Winter Weathermaker for every type of home, every climate, every kind of gas or oil—33 models in all.

And the Winter Weathermaker is "the furnace with a future" because it's all set for summer air conditioning—with matching coil casings, ample fan capacity, and a special heating and cooling thermostat. Future business in summer cooling is built right into each furnace.

So cash in on Carrier, the *year-round* profit line! To start the money pouring in, call your nearest Carrier distributor. You'll find his name listed in the yellow pages of your classified telephone book. Or write direct to Carrier Corporation, Syracuse, New York.

This is the new Carrier Winter Weathermaker—"the furnace with a future." The inexpensive coil casing (shown on top) replaces the old-fashioned plenum and the cooling coil may be inserted during the initial installation or at some future date. This upflow furnace is available for either oil or gas and in capacities from 75,000 to 210,000 Btu/hr input.

Carrier Downflow Winter Weathermaker—available gas or oil fired in capacities from 75,000 through 150,000 Btu/hr input. Matching cooling coil section fits neatly under the furnace.

Carrier Horizontal Winter Weathermaker—available gas or oil fired in capacities from 85,000 to 231,000 Btu/hr input. Matching cooling coil section fits in ductwork as shown.

New Weathermaker Control Center—exclusive with Carrier. Instant switching from heating to cooling. The word "COOL," on thermostat, reminds owner that he can add cooling to his furnace.

Circle No. 26 on Reader Service Card

America's leading air conditioning year-round profits!

Carrier Year-round Weathermaker—for new homes or to replace worn-out furnaces. Heats and cools an entire house. Water-cooled or air-cooled. Uses gas or oil for heat. Capacities from 1.7 to 7.5 tons.

Carrier Summer Weathermaker—for homes with steam or hot water heat or with no central heat at all. Has its own fan and filter. Uses a separate duct system. Available in capacities from 2 to 5 tons.

Carrier Conversion Weathermaker—for existing homes with upflow furnaces. Fits any standard warm air furnace. With air-cooled refrigerating section, it comes in capacities from 2 to 5 tons.

Carrier Conversion Weathermaker—for existing homes with downflow furnaces. Fits neatly below the furnace which is raised only about 12 inches. Available from 2 to 5 tons. Requires no water.

Carrier Conversion Weathermaker—for existing homes with horizontal furnaces. Fits in duct beside furnace. Air-cooled refrigeration section located outdoors. From 2 to 5 tons capacity.

To help pre-sell your customers on Carrier comfort, Dave Garroway and Arlene Francis will reach millions of prospects with the Carrier story on their NBC-TV shows "Today" and "Home."

Carrier

AIR CONDITIONING
REFRIGERATION
INDUSTRIAL HEATING

Circle No. 26 on Reader Service Card

ABOUT PEOPLE

William H. Schrader has been appointed vice president in charge of finance at Servel, Inc. For the past three years he has been director, first vice president and treasurer of Easy Washing Machine Corp. Schrader succeeds Rudolph Schnakenburg, who retired earlier this year after having been with Servel for 35 years.

•

Paul C. Ford has been appointed chief engineer of the Electrical Div., Wagner Electric Corp. He succeeds C. P. (Charlie) Potter who is retiring after more than 46 years with the firm. Ford, who joined Wagner in 1937, has been assistant manager of the company's transformer engineering division since 1953.

•

Robert K. Eskew has been promoted to product director for all-year air conditioning by Servel, Inc. In his new capacity, Eskew will be responsible for introduction of new products, improvement of current products, and elimination of unprofitable items. He has served in various capacities at Servel for 22 years.

•

Emerson Radio & Phonograph Corp. has named **Frank Mitchell** as sales manager, and **J. Carl Brigance** as midwest district manager of its air conditioning division. Mitchell was formerly general sales manager of the appliance division of Servel, Inc., and Brigance had been executive vice president and general manager of Mid-America Appliance Corp. in Omaha where he will continue to headquarter.

•

William G. Huston has been named western regional sales manager for the heating and cooling division of Union Asbestos & Rubber Co. Huston, whose headquarters will be in San Francisco, has a background of more than 30 years in the air conditioning field and will supervise the company's heating and air conditioning sales in 11 far western states.

•

E. N. Foss has been appointed manager and P. J. Zilles, sales manager, of the newly-created air cleaning products department of the Sturtevant Div. Westinghouse Electric Corp. Both Foss and Zilles have served in various sales and managerial positions since joining Westinghouse in 1934, and 1925 respectively.

•

Henry M. Heyn, Albert L. Hollinger, and **Robin A. Bell** have recently been elected vice presidents of Surface Combustion Corp. Heyn is sales manager of the Heat Treat Div., Hollinger is manager of the Steel Mill Div., and Bell is general manager of Janitrol Heating & Air Conditioning, Automotive & Aircraft Div's.

•

Donald W. Davis, Jr. has been named midwestern regional manager of Westinghouse Electric Corp.'s Sturtevant Div. Davis is in charge of sales, engineering and the application of air handling equipment, such as fans, blowers and other commercial and industrial heating and ventilating apparatus, in the area's eight states. He was northwestern district manager from 1953 until his new appointment.

•

Four regional sales managers have been appointed to newly created posts by Gibson Refrigerator Co. The new managers and their headquarter cities are: **William E. Brawner,** New York; **Arnold L. Kawsky,** Chicago; **Kenneth H. Luse,** Cleveland; and **L. M. Gary,** Washington, D.C. Brawner, who was formerly with General Electric Co., will cover New York

W. E. Brawner A. L. Kawsky

K. H. Luse L. M. Gary

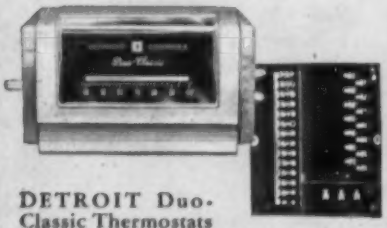
and the New England states, as well as eastern Pennsylvania, including Philadelphia. Kawsky, whose territory will include Detroit, St. Louis and surrounding areas, as well as Chicago, was formerly with Chrysler Airtemp. Luse comes to Gibson from Carrier Corp. and will service Ohio, western Pennsylvania, West Virginia, Kentucky and Tennessee. Gary was formerly an executive engineer with Chrysler Airtemp and will cover Virginia, Maryland, Delaware, North and South Carolina.

•

Roger R. Burns has been appointed factory representative by La Crosse Cooler Co. He will replace E. C. Redmond, who had

Your Best Full-Line Source For Every Refrigeration Job

DUO-CLASSIC THERMOSTATS



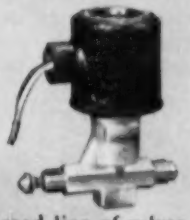
DETROIT Duo-Classic Thermostats and the Universal (self-powered) Control Panel for Summer-Winter air conditioning. Simplified installation and operation!

EXPANSION VALVES

Complete line of distributors, up to 18 passes.

A broad line of valves with capacities to 25 tons F-12 and 40 tons F-22.

SOLENOID VALVES

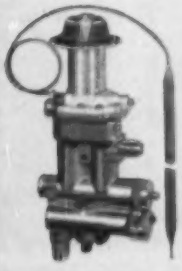


A broad line of valves with capacities to 50 tons F-12 and 60 tons F-22.

Special purpose miniature solenoid valves for any application.

DETROIT CONTROLS

DETROIT SELECTAFLOW CONTROL



Thermostatic selector valve for Summer-Winter air conditioning systems using hot and cold water as the heat transfer medium in a single supply and return line. Completely automatic and self contained.

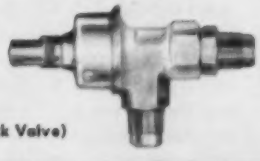
AUTOMATIC CONTROLS

A wide range of automatic controls for pressure, temperature, dual pressure, and sequencing applications.

AUTOMOTIVE AIR CONDITIONING CONTROLS

Combination by-pass and suction valve with operating cam. These valves are engineered to meet high performance requirements.

CRANKCASE PRESSURE REGULATOR



(Hold-back Valve)

Get the COMPLETE Picture . . .
Use the COMPLETE Line . . .

See Your DETROIT CONTROLS Wholesaler

. . . or write for condensed Catalog 200-D

DETROIT CONTROLS CORPORATION
5900 TRUMBULL AVE. • DETROIT 8, MICHIGAN
Division of AMERICAN - Standard

Representatives in Principal Cities • Canadian Representatives: RAILWAY AND ENGINEERING SPECIALTIES, LTD., Montreal, Toronto, Winnipeg.

AUTOMATIC CONTROLS for REFRIGERATION
AIR CONDITIONING • DOMESTIC HEATING • AVIATION • TRANSPORTATION • HOME APPLIANCES • INDUSTRIAL USES

Circle No. 27 on Reader Service Card

been with the company for several years. Burns will cover the states of Wisconsin, Minnesota, Michigan, Iowa, Nebraska, North and South Dakota.

•

William A. Neighbors has been appointed Atlanta district residential sales manager for the unitary equipment division of Carrier Corp. He succeeds **Tom Ware,** who joins Carrier-Houston Corp., the company's newly formed distribution subsidiary in Houston, Texas. Neighbors has been assistant to the manager of Carrier's branch office in Jacksonville, Fla.

•

Charles F. Spencer has been named manager of the midwestern district of Warren Co. Inc. Succeeding him as south-central district manager is **George R. Harvey, III.** Spencer will headquarter in Chicago and cover a territory which includes northern Indiana, northern Illinois, northern Missouri, Nebraska, Iowa, and southern Wisconsin. Harvey, from his headquarters in Little Rock, will service the Evansville, Indiana area, southern Illinois, far-west Kentucky, western Tennessee, Mississippi, Arkansas, Oklahoma, Kansas, and southern Missouri. Also added to Warren's sales staff is **Robert M. Warren,** who joins the company's chain-stores division as account executive and assistant manager of the division. He will headquarter in Atlanta.

•

George Berk has been named sales promotion manager for the Lewyt Air Conditioner Corp. Prior to his position with Lewyt, Berk was sales promotion manager for T. A. O'Loughlin Co., Newark.

•

Douglas S. Sterner has been named manager of the air conditioning-refrigeration division of General Controls Co., and **B. L. Lerch** has been appointed midwest regional manager of the firm. For the past year Sterner had been district manager for Typhoon Air Conditioning Co. in Atlanta, Ga. He had formerly been with General Controls at the firm's midwestern headquarters in Skokie, Ill. Other appointments include **Norbert A. Grainer,** who has succeeded Lerch as manager of the Chicago branch, **Jack Croushore** and **Ray Wheeler,** who have been named regional representatives in Chicago and Columbus, Ohio respectively.

D. S. Sterner

•

A. W. (Cap) Barr has been promoted to the position of eastern regional sales manager for Penn Controls, Inc. In his new capacity he will be responsible for sales

Sales have to be Surefire

WHEN SO MANY DEALERS SELECT SODAMASTER BEVERAGE DISPENSING EQUIPMENT AS A FAST-MOVING SPECIALTY ITEM

"I get a real charge out of this."

The reasons why Sodamaster Dealers enjoy such tremendous success are simple: (1) Each salesman carries the figures to present during the sale which prove that Sodamaster pays for itself in amazingly short order; and (2) Sodamaster solves major problems facing any customer who serves mixed or soft drinks. Rarely does an item carry these basic ingredients of a sale to such a convincing degree. And virtually every neighborhood tavern or cocktail lounge, restaurant, hotel, sports arena, public recreation and entertainment spot, is a first rate prospect for Sodamaster equipment.

PATENTED, EXCLUSIVE SODAMASTER FEATURES PROVIDE THESE POINTS OF SUPERIORTY

- The identical beverages previously obtained from bottles—with carbonation equal or higher.
- As much as 65% savings on bottled flavors, 96% savings on club soda.
- A variety of flavors, instantaneously, at the finger tips.
- Unmatched service speed, avoiding dissatisfaction and "walkouts" at rush periods.
- Elimination of costly, troublesome, time-consuming bottle handling.
- Uniform coldness and perfect proportions of beverages, automatically.

MAIL THIS COUPON TODAY

For literature outlining the opportunity now open to make bigger profits selling Carbonic Dispenser Sodamaster, Mix-Monitor Faucet and Supercharger Carbonator Equipment.

Name

Address

City State

CARBONIC CD DISPENSER INC.
CANFIELD, OHIO

Sodamaster Systems are available in completely self-contained, refrigerated, Single Cabinet Models, or may be installed remotely with faucets only in the service area.

West Coast Plant: 1851 Randolph St., Los Angeles, Calif.
IN CANADA: GENERAL EQUIPMENT CORP., LTD., TORONTO, ONT.

Circle No. 28 on Reader Service Card

activities in the company's Philadelphia, Boston, New York, and Rochester offices. Replacing Barr as district manager of the firm's Boston office will be **James Garrett,** who has served as sales engineer in that office for the past several years.

•

C. Adrance Montague has joined York-Shipley, Inc. as manager of residential air conditioning sales. In this capacity he will plan a broad 1956 program for penetrating the mass market, and will institute an air conditioning training program for factory personnel, field salesmen and representatives of dealers and distributors. Montague had formerly been general sales manager of Kalamazoo Furnace & Appliance Mfg. Co.

•

Neil Winikoff, manufacturers' representative in Seattle, has been appointed sales representative for Cincinnati Sub-Zero Products Co. His territory will include the states of Washington and Oregon.

•

Gordon N. Anderson has been appointed central district sales manager for Pak-A-Way Food Freezer Div., Schaefer, Inc. He will supervise sales activities in 19 states in the midwest. Anderson has been with the Schaefer sales organization for the past four years.

•

Edward A. Nixon has been appointed chief engineer of the Jamison Cold Storage Door Company. Before joining Jamison, Nixon was chief engineer of the Marine Mfg. & Supply Co.

•

C. W. Pollock has rejoined the commercial division of Drayer-Hanson, Inc. as chief engineer, and **Leonard Alpert** has been promoted to personnel manager of the company. Pollock, formerly vice president and chief engineer of Drayer-Hanson, terminated a nine year association in 1951 to become a manufacturers' representative. Alpert, formerly assistant personnel manager, fills a vacancy created by the resignation of Dwight Prouty, Jr.

•

Joe H. Bergheim has been named technical secretary and **Chester R. Venemann** has been appointed to the public relations staff of the Air-Conditioning and

end pipe condensation problems with...

JARROW Condenseal SPONGE TUBING

Jarrow Condenseal Sponge Tubing is tough, flexible sponge rubber, made up of uniform, *non-connecting cells that effectively block moisture passage!*

Its non-absorbent quality makes it ideal for pipe insulation.

Withstands temperatures from −40° F. to + 225° F. Thermal conductivity of Condenseal is .28 at 75° F. with no deterioration.

Condenseal is available through your Wholesaler.

Ask your Wholesaler for the new Jarrow Catalog C-300, today.

A PROFIT-MAKER FOR YOU

INCREASES YOUR CUSTOMERS' SATISFACTION

EASY TO INSTALL • AVAILABLE IN 50 FOOT LENGTHS

JARROW PRODUCTS INC.

420 NORTH LA SALLE STREET • CHICAGO 10, ILL

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Refrigeration Institute. Bergheim succeeds John R. Schreiner, who has joined Carrier Corp. He will serve as coordinator of various Institute engineering and standards committees and as advisor to the ARI staff. Venemann will edit *Koldfax*, monthly magazine of the Institute, and will assist in publicizing Institute activities as well as preparation of sales promotion material for equipment manufactured by its members.

•

Olin D. Blessing, sales manager of Dow Corning Corp., has been made a vice president of the company. When Dow Corning began doing business in February, 1943, Blessing was its first full-time employee.

•

Richard E. Heaven has been appointed a regional sales manager by Thatcher Furnace Co. In his new capacity, Heaven will supervise a sales staff and coordinate dealer-company relations in eastern Pennsylvania, Washington, D.C., Virginia, Maryland, North and South Carolina, and Delaware. With the Thatcher sales department since 1950, he has represented the company in Virginia and the Carolinas.

•

G. S. Crane has been elected chairman of the board of directors of Cutler-Hammer, Inc., replacing H. F. Vogt who has retired after 56 years of service in the company. Succeeding Crane as president and chief executive officer is **Philip Ryan,** executive vice president and vice president in charge of manufacturing and development engineering. Crane was also elected chairman of the newly created plans committee, and Ryan was appointed vice-chairman. Also named was **J. C. Borden,** company controller since 1947, who has been elected vice president and controller.

•

Several new appointments have recently been made by the home heating and cooling department of General Electric Co. **R. R. Routh, Jr.** has been named advertising and sales promotion manager; **Norman R. Austin** has joined the marketing unit of the department as distribution planner; and **G. E. Taylor, Jr.** and **R. F. Bogle** have been appointed modernization specialist and builder-sales specialist.

R. R. Routh

•

G. Worthington Hipple has been named eastern regional manager for the Fedders-Quigan Corp. Hipple succeeds Ed Becker who was recently named sales manager of the refrigeration division.

•

Earl N. Barton and **Leonard S. Venable** have recently been elected directors of Warren Co.

E. N. Barton L. S. Venable

Inc. Barton is assistant sales manager and director of advertising, and Venable is assistant secretary and assistant treasurer. Both men have been associated with the company for more than ten years.

•

Three additional representatives have been added to the field organization of Punxsutawney Co. **Alfred Silberman** will headquarter in Saratoga Springs, N.Y. and will contact distributors in the New England territory and western New York. **Alfred Wallahan,** from his headquarters in Omaha, Neb., will cover Minnesota, Iowa, Nebraska, North and South Dakota, Montana, Wyoming, and Colorado. **Flint A. Pendergraft,** with headquarters in Houston, Tex., will cover Texas, Oklahoma, New Mexico, and part of Louisiana.

•

E. G. Haight has been appointed sales engineer in the contract commercial refrigeration department of Kelvinator Div., American Motors Corp., and **R. G. Alexander** has been named to succeed him as commercial wholesale manager. In his new position, Haight will concentrate his activities on contract sales of condensing units, refrigerating systems and compressors, and automotive air conditioning.

E. G. Haight

•

Clarence P. Martin has been promoted to supervisor of the newly-created sales-service order department of Servel, Inc. In his new position, Martin will be responsible for the handling of all orders for finished products and parts. He has been with the company for 14 years, and has been user contact manager since 1951.

•

Gibson Refrigerator Co. has appointed **Robert Suazo** as manager of export sales in South and Central America, and **B. M. King** and **P. D. Middleton** have been named export managers for Canada and the Eastern Hemisphere respectively. Suazo has been export manager for Replogle Globes, Inc. for the past two years. Both King and Middleton are long-time members of the Gibson export sales staff.

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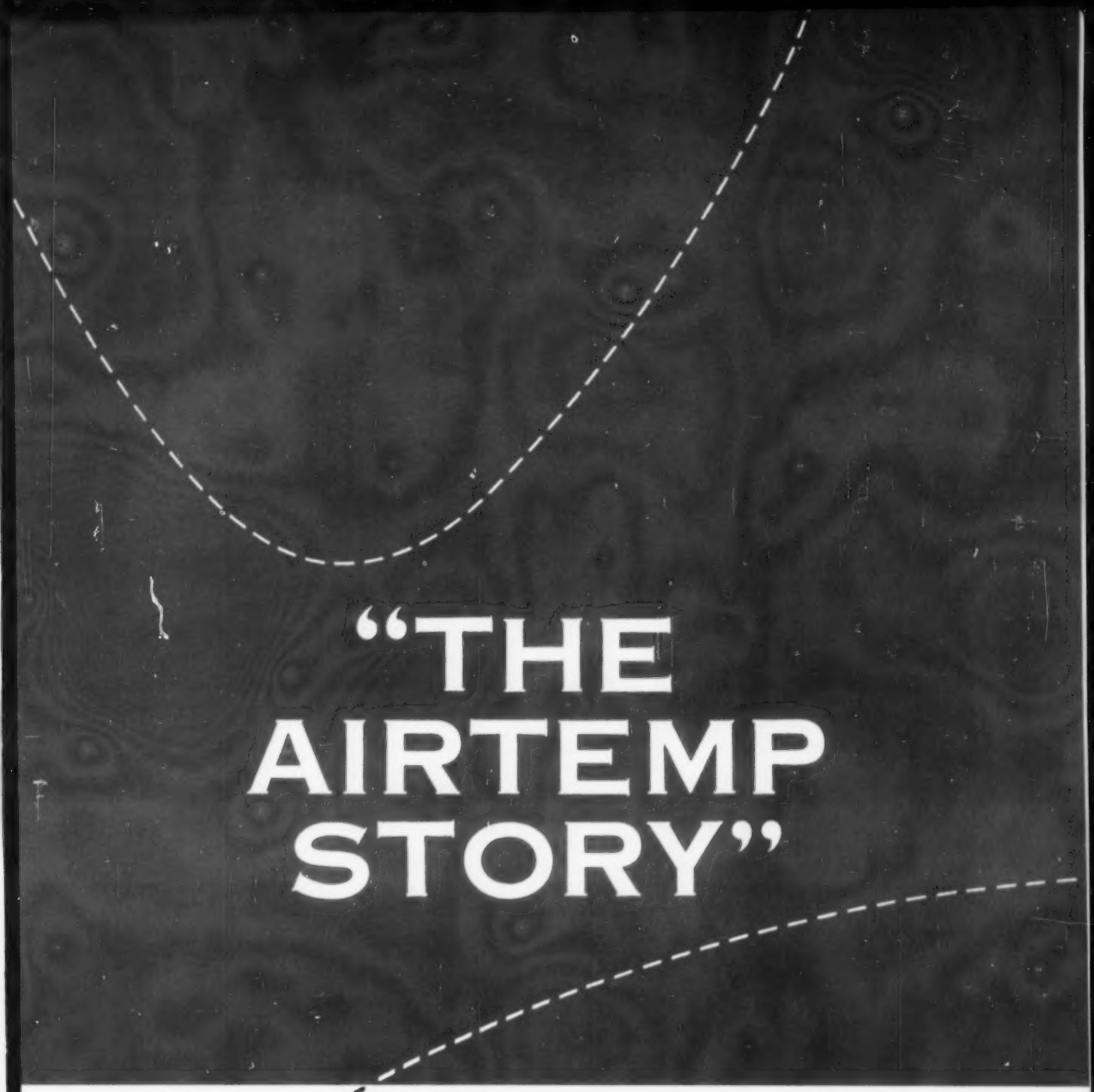


"THE AIRTEMP STORY"

Airtemp
DIVISION
CHRYSLER CORP

An objective view of your future as a dealer in air conditioning and heating

THE FACTS BEHIND THE

AIRTEMP HELPS YOU GET BUSINESS—
AIRTEMP HELPS YOU STAY IN BUSINESS

1. ***Powerful Advertising Support At National Level.***
Airtemp's advertising program, unequalled in the industry, gives your product its first push. It pre-sells many of your customers to make your selling so much easier.

2. ***Sales-Producing Promotions at Local Level.***
These are coordinated with national advertising to give your sales effort further impact—and targeted at special local markets to move more products and increase your dollar volume.

3. ***Strong Distributor Backing All the Way.***
The Airtemp distributor organization is a specially selected group—selected on the basis of experience, knowledge of air conditioning in all its phases, and ability to service any kind of dealer requirement.

4. ***Sales Assistance When You Need It.***
When you have a merchandising problem or a situation demanding an expert, the Airtemp distributor cooperating with a factory-trained sales specialist comes in to help you close the sale.

And with your Airtemp Franchise—the famous Airtemp line of "Packaged" Air Conditioning Systems —the most complete line in the industry!

Model 1493 Evaporator Cooling Coil on Model 4180 Hi-Boy Furnace

Model 1202-2 and 1203-1 Condensing Unit

for solid *yearound* selling, Airtemp for *any* type of business

AIRTEMP FRANCHISE

Before you take on any franchise you should consider many things. One consideration, however, should come above all others—the *character* of the franchise.

To us, character means the manufacturer's . . . and distributor's . . . integrity, experience and assurance of continued help to the dealer partner.

Therefore, we of Airtemp urge you to carefully examine the following so that you can make the decision best suited to your interests.

5. *Engineering Assistance When You Need It.*
If you run into a unique air conditioning requirement or a special application, again you can depend on skilled Airtemp factory and distributor personnel to help you sell the job or get it done.

6. *Financial Assistance When You Need It.*
In matters of customer or dealer financing, Airtemp has a Financial Plan and experts to advise you.

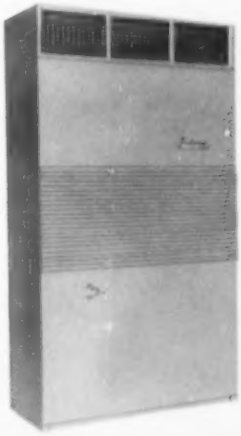
7. *Continuous Dealer Educational Program.*
Airtemp factory and distributor specialists constantly keep you informed of new developments and new applications in today's rapidly changing air conditioning market.

8. *Outstanding Consumer Preference.*
Millions of Americans drive a Chrysler-made car. Millions of others know the Chrysler genius for engineering excellence and leadership.

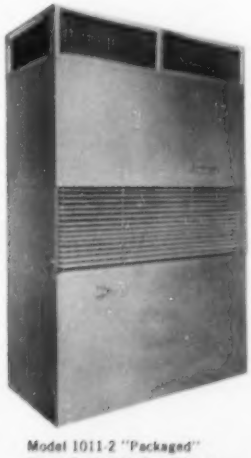
9. *Leadership and Experience in Air Conditioning.*
Leadership is both the inevitable reward for distinguished achievement and the logical outgrowth of greater experience.

Model 1205 Condensing Unit

Model 1005-2 "Packaged" Water-Cooled Air Conditioner. New '56 styling!



Model 1008-2 "Packaged" Water-Cooled Air Conditioner.



Model 1011-2 "Packaged" Water-Cooled Air Conditioner.

SIX OTHER WATER-COOLED MODELS IN 2, 3, 15, 20, 25 and 30 H. P.

gives you waterless *and* water-cooled air conditioning for *every* kind of business requirement!

1956—YEAR OF DECISION FOR THE AIR CONDITIONING DEALER—1956

The past few years have witnessed a tremendous growth in the development and expansion of air conditioning. Now, with complete public acceptance of air conditioning as a necessity, the market potential is virtually unlimited. Industry research experts forecast the sale of millions of units at billions of dollars.

What does this mean to you as an air conditioning dealer? It means doing business in a *growth market* as compared to a *saturation market.*

What will be the outcome? It can safely be predicted that the next few years will see an increasing number of new air conditioning manufacturers lured by the promise of rich rewards in a market which is *anything* but a saturation market.

The result will be an increasingly competitive situation in which many of these new lines will be withdrawn, leaving the dealer without the support of a strong line. Witness what has happened to many dealers in home appliances, automobiles, television and, more recently, room air conditioners.

Just what should you look for in an air conditioning line? Chief among these are a "sense of merchandising," solid national advertising schedules for every media, hard-hitting local and off-season promotions, and specialized campaigns for specific businesses. And you also need a manufacturer with the know-how and experience to do these jobs effectively.

But all this is only the marketing side of the air conditioning business . . . a business which by its inherent nature is like no other. What else is needed?

Once again, in terms of the dealer, he has to have specialized help. Factory-trained men to help him on special engineering applications, men to guide his sales effort, financing aid when necessary to the sale. And experience, *again*, is needed to do these jobs effectively.

This is your *year of decision*, if you are to become a dealer in air conditioning. Select the manufacturer who can give you the finest and most complete line of air conditioning, the greatest number of specialized services, the most effective selling tools, and all the help you need when it is needed. Above all, choose an *experienced* manufacturer of air conditioning equipment—one whose *only* business is air conditioning—who, therefore, is in the best position to help you *get* business and can best help you to *stay* in business year after year.

FRANCHISE FOR GREATER PROFITS WITH -- Airtemp DIVISION CHRYSLER CORP.

Your nearest Airtemp Distributor is listed below.
Call him for the most profitable future in Packaged Air Conditioning.

ATLANTA REGION
Ramseur Equip. Co.
Greenville, S. C.
Southernair Co.
Durham, N. C.
Dealers Supply Co., Inc.
Atlanta, Ga.
Horne-Wilson, Inc.
Tampa, Florida
Horne-Wilson, Inc.
Orlando, Florida
Horne-Wilson, Inc.
Jacksonville, Florida
Horne-Wilson, Inc.
Tallahassee, Florida
Central Dist., Div. of Central Air Conditioning & Htg., Inc.
Nashville, Tennessee
Southern Air Cond. Htg. Dist., Inc.
Chattanooga, Tennessee
Air Conditioning Dist.
Miami, Florida

CHICAGO REGION
Frank J. Kersher Co.
Manitowoc, Wisconsin
James B. Clow & Sons
Chicago, Illinois
Conditioned Air, Inc.
South Bend, Indiana
Globe, Incorporated
Minneapolis, Minn.
Hardware Prod. Co.
Sterling, Illinois

DALLAS REGION
Royalair Dist.
Dallas, Texas
Dealers Supply Co.,
Div. of Temperature Control
Tulsa, Oklahoma
Air Accessories, Inc.
Ft. Worth, Texas
Low-Temp Dist., Inc.
San Antonio, Texas
Baker Eng. Company
Lubbock, Texas
Air Cond.,
Div. of United Electric Co.
Wichita Falls, Texas
Red River Dist.
Sherman, Texas
Comfort Dist.
Oklahoma City, Oklahoma
The Caperton Co.
Tyler, Texas
Airtex, Inc.
Houston, Texas

DAYTON REGION
Temperature Control, Inc.
Indianapolis, Indiana
General Air Supply Co.
Dayton, Ohio
Air Therm Supply Co.
Cleveland 12, Ohio
H & C Supply Co., Inc.
Akron, Ohio
The Palmer-Donavin Mfg. Co.
Columbus, Ohio
The Mutual Mfg. & Supply
Cincinnati 25, Ohio
Stratton & Terstegge Co.
Louisville, Kentucky
Banks-Miller Supply Co.
Huntington, West Virginia

DETROIT REGION
Kalamazoo Mech. Serv. Co.
Kalamazoo, Michigan
Arthur Boot Co.
Grand Rapids, Michigan
Hager-Fox Htg. & Ref. Co.
Lansing, Michigan
Hager-Cove Lumber Co.
Lansing, Michigan
Star Steel Supply Co.
Detroit 34, Michigan

NEW ORLEANS REGION
Steel City Supply Co., Inc.
Birmingham, Alabama
Ark-La-Tex
Monroe, Louisiana
Kremser Wholesale
Clarksdale, Miss.
Refrigeration Equip. Co.
Baton Rouge, La.
Kremser-Oliver Co., Inc.
Jackson, Mississippi

NEW YORK REGION
Cooling Prod. Dist., Inc.
Bronx, New York
Dornoil Company, Inc.
Newark, New Jersey
The Eastern Company
Cambridge, Massachusetts
Fox Brothers Fuel Co., Inc.
Fair Lawn, New Jersey
Slye Supply, Inc.
Pittsfield, Massachusetts
Utica Oil Htg. Corp.
Utica, New York
Air Cooling Prod.,
Div. of Airaconda Air Conditioning Co., Inc.
New York, N. Y.
North Star Supply, Inc.
Buffalo, New York
A & M Distributors
Red Bank, New Jersey
Central Queens Elect. Supply Corporation
Jamaica, New York
Standard Dist, Inc.
Hartford, Conn.
AHR, Incorporated
Rochester, New York

PHILADELPHIA REGION
Wilson Supply Co.
Washington, D. C.
Lincoln Sales Corp.
Baltimore 2, Maryland
Dorries Distributors
Wilmington, Delaware
York Radio & Ref. Parts
York, Pennsylvania
Proie Brothers, Inc.
Pittsburgh, Pennsylvania
Allentown Supply Corp.
Allentown, Pennsylvania
Colonial Sales Corp.
Norfolk, Virginia
Kingston Electric Co.
Kingston, Pennsylvania
Neyharts', Incorporated
Williamsport, Pennsylvania
S. S. Fretz, Jr., Inc.
Philadelphia, Pennsylvania
Southern Ref. Corp.
Roanoke, Virginia
Felheim Htg. & Roofing
Erie, Pennsylvania

ST. LOUIS REGION
E. E. Souther Iron Company
St. Louis, Missouri
Western Supply Company
Wichita, Kansas
Waldens', Inc.
Denver 11, Colorado
Truog-Nichols Distributing Co.,
Div. of
Dan Truog & Clyde Nichols, Inc.
Kansas City, Missouri
Ohio Valley Hardware Co., Inc.
Evansville, Indiana
A & T Distributors,
Div. of Air Temperature, Inc.
Memphis, Tennessee
555, Incorporated
Little Rock, Arkansas
Sidles Company
Des Moines, Iowa
Sidles Co.,
Air Conditioning Division
Omaha 2, Nebraska
Automatic Htg. & Cooling Corp.
Sioux City, Iowa
Baker McClintic Company
Columbia, Missouri
Buddy Melnik
Wholesale Distributing Co.,
Div. of Tru Temp, Incorporated
Decatur, Illinois

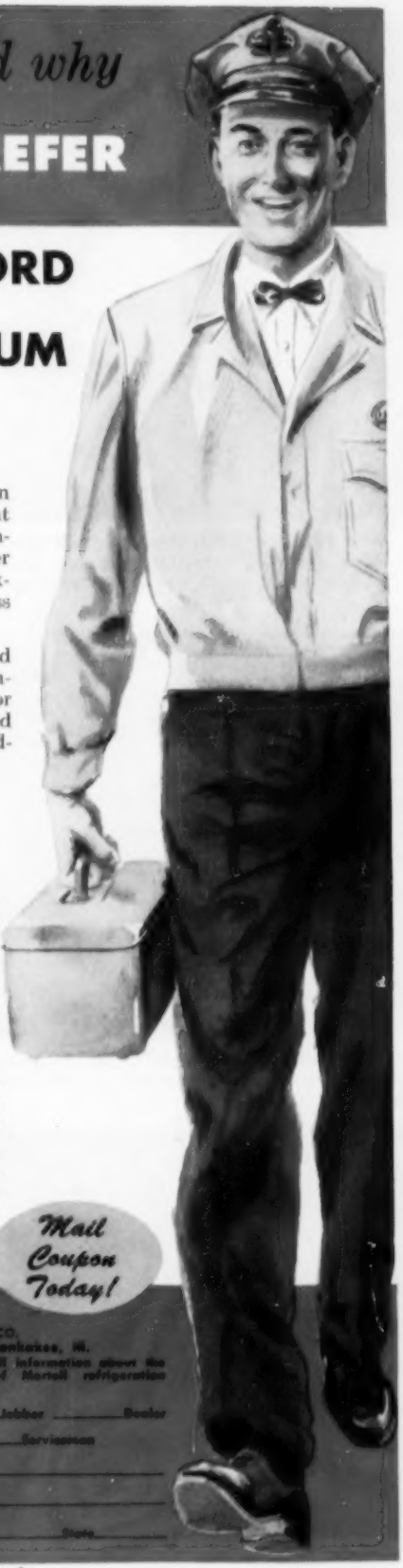
WEST COAST REGION
Ralph Dusenbery
Yuma, Arizona
Air Products,
Div. of Climate Control Co.
Phoenix, Arizona
Therm-O-Rite
Toronto, Ontario, Canada
Ashburn Supply Co.
Culver City, California
American Htg. Equip. Co.
Seattle 77, Washington

Have you discovered why

SERVICEMEN NOW PREFER

Mortite CAULKING CORD and CAULKING GUM

for every Sealing Job?



Acceptance Proves It! From coast-to-coast refrigeration service and maintenance men have discovered two great MORTELL products which give them price, convenience and quality advantages *unmatched* by any other compound on the market today. Now, sealing and caulking jobs are finished faster, better and at much less cost than ever before!

"Tool Kit" Size! Both *Mortite Caulking Cord* and *Mortite Caulking Gum* come in handy cylindrical containers—easily fit into any crowded tool box, large or small. These compact containers have been designed by working refrigeration servicemen to eliminate product waste resulting from flimsy, bulky packages.

THESE FACTS TELL THE DIFFERENCE!

MORTITE CAULKING CORD—$\frac{7}{16}$" rope-like strands always retain the consistency of modeling clay. Non-staining, Mortite White in color—may be painted *immediately* after application. Three compact 8-strand 16-ft. rolls can be unwound one or more strands at a time without unwinding entire roll.

MORTITE CAULKING GUM—Provides the perfect answer for the serviceman who needs a bulk caulking compound to hand mould into beads, wads, gaskets, etc. One pound slug (2½" x 6") never cracks or hardens—adheres to any clean, dry surface through normal temperature ranges.

Mail Coupon Today!

Mortite Caulking Cord or Mortite Caulking Gum will do the job better than your present caulking compound at a fraction of your present cost. Write today for complete information about these two products and the complete line of Mortell refrigeration products.

J. W. Mortell COMPANY

Makers of Famous MoDrip Tape and Mortite

J. W. MORTELL CO.
553 Birch St., Kankakee, Ill.
O.K! Send me full information about the complete line of Mortell refrigeration products.

I'm a _____ Jobber _____ Dealer
_____ Serviceman

Name _____

Address _____

City _____ State _____

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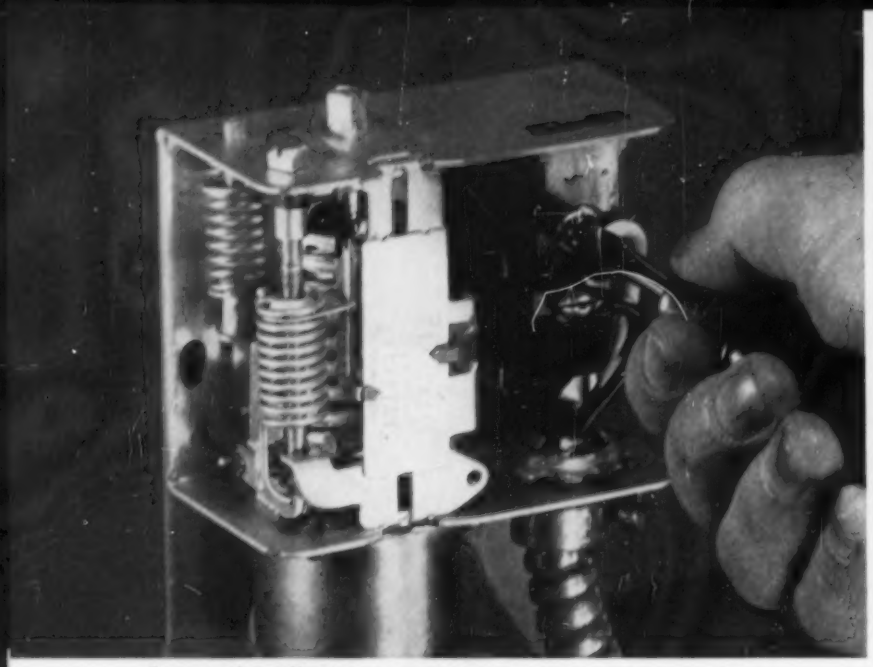
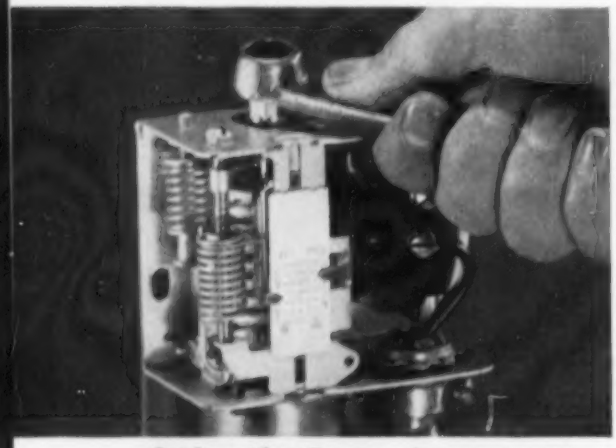
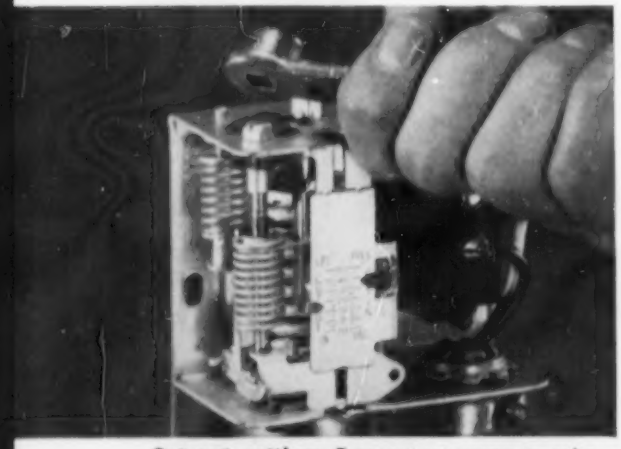


Easy to install: Mount control on compressor unit or any flat surface (bracket furnished) and connect flare nut on capillary. Then, make 2 simple electrical connections; terminals are easily accessible.

Series 270: Available in single or double pole construction with or without external adjusting knob.



Cut-in setting: To raise or lower cut-in setting, turn cut-in screw as required . . . differential does not change.



Cut-out setting: Turn cut-out screw to raise or lower cut-out setting independently of cut-in setting. This widens or narrows differential.

PENN REFRIGERATION CONTROL IS EASIER TO INSTALL AND ADJUST

Single Pole Series 270 Combines

Simple Design With Snap-Acting Contact

Action For Long-Life Dependability

Designed with *you* in mind, the Series 270 takes all the hard work out of installation. And, adjustment is even simpler because of Penn's direct-reading, calibrated scale indicating cut-in and cut-out settings. Time-wasting subtraction or addition is eliminated.

Once installed, the Series 270 will perform longer, better, more accurately! One reason is the exclusive contact structure which provides "roll-wipe-snap" action on closing and opening. There's no bounce . . . no closing arc . . . no welding of contacts.

Try the Penn Series 270 on your next job and you'll see the great difference. Ask your wholesaler for the "270."
Penn Controls, Inc., Goshen, Indiana.

PENN AUTOMATIC CONTROLS

For Heating, Refrigeration, Air Conditioning, Gas Appliances, Pumps, Air Compressors, Engines.

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BTU'S

TRENDS · OPINIONS · REPORTS

HEAT FROM ICE has been successfully produced by research workers at the University of Toronto on behalf of the Canadian Defense Research Board. They have developed a novel version of the heat pump, for use in arctic regions, that operates on the principle that there is latent heat in the fusion of ice. This is made available in usable form by drawing 32 F water from beneath the ice surface and converting it into ice by means of a diesel powered refrigeration compressor. The exhaust and cooling water heat is recovered in heat exchangers and is then available for distribution as needed. The ice produced is disposed of through a rugged fan which pulverizes it and disperses it to the atmosphere. Designed to save fuel costs, the unit produces about 40,000 Btu per pound of fuel compared to an average of 15,000 Btu for a conventional heater.

INCREASING RECOGNITION by educational authorities of the importance of air conditioning is evidenced by the recent approval of a $720,000 air conditioning program at Louisiana State University. The project calls for the building of a central unit with immediate conditioning of several buildings and a view to eventual air conditioning of the entire campus. The State Building Authority okayed the grant after school official Daniel Borth testified that many research projects require air conditioning.

FITTING TRIBUTE to the man generally acclaimed to be "the father of air conditioning" is the Willis H. Carrier Scholarship which has been established by Carrier Corp. at Cornell University, from which Dr. Carrier was graduated in 1901. The scholarship will be awarded to an entering student in Cornell's Sibley School of Mechanical Engineering and will be renewable for the full five-year undergraduate course. It will provide $750 a year.

HOUSES THAT FACE "the wrong way" can cause an increase of almost 100% in air conditioning load, according to studies recently reported by the National Warm Air Heating and Air Conditioning Association. Tests on a 1,040 sq. ft. house in Urbana, Ill., showed that, facing south, it was subject to a heat load of 22,300 Btu/hr, based on a temperature of 75 F indoors when the outdoor temperature was 95 F. Heat load under similar conditions if the house were oriented in other directions, it was calculated, would be 22,000 Btu if facing north; 33,000 Btu if facing east, and 41,800 Btu if facing west. Increased heat load results chiefly from sun load on exposed glass and wall area. Load on the roof is not affected.

RE-EVALUATION OF INSULATION THEORIES has been necessitated as a result of industry trends toward the use of greater extremes in temperature, Charles Q. Livingston recently told the Thermal Insulation Society. Technical advisor to Armstrong Cork Co.'s insulation division, Livingston pointed out that in addition to high and low temperatures never before used in industry there now exists an exposure problem resulting from the increasing use of equipment outdoors. To meet these demands, he declared, new research facilities and testing methods are being developed by insulation manufacturers.

A MARKED TREND in favor of packaged air conditioners over other types of cooling systems has become increasingly apparent over the past four years, according to G. K. Iwashita, general manager of G.E.'s commercial and industrial air conditioning department. He said that from 1950 to 1954 there has been a 91% increase in the share of total air conditioning going to packaged unit air conditioners. In view of this fact, he believes it possible to put dealers in a position to sell on a sound and profitable year-round basis instead of in three or four hectic months. One of the big challenges facing the air conditioning industry today, is to educate the public that there is no valid reason for waiting until spring or summer to air condition.

This simple "folksy" type of house organ helps a Wisconsin refrigeration dealer

Boost Business Three Ways . . .

Facks 'N' Figgers
REFRIGERATION EQUIPMENT COMPANY
Here is your Copy of Facks 'N' Figgers FOR AUGUST
REFRIGERATION EQUIPMENT CO.

KEEP IT FREE of direct advertising, this dealer cautions, if you want your house organ to do the best selling job.

EVEN an unpretentious and relatively inexpensive external house organ, carefully prepared and wisely used, can effectively sell commercial refrigeration and air conditioning equipment. That simple fact has been adequately demonstrated by the experience of Refrigeration Equipment Co., Madison, Wis., with the newsy little 4-page paper which it distributes each month to some 2500 customers and prospects.

According to Ray Messner, president of the dealership, "Facks 'N' Figgers" (formal name of the firm's news sheet) successfully accomplishes three important jobs for his company:

(1) It proves his best medium of advertising, being far and away the most productive in terms of dollar cost;

(2) It has developed into his most effective sales tool, working either on its own or in the hands of salesmen;

(3) It performs a public relations function by enhancing the company's prestige in the eyes of its customers and prospects, while at the same time increasing their desire for the firm's merchandise.

"Facks 'N' Figgers" differs from many other house organs published by dealers and distributors in this field because Messner feels very strongly that direct advertising is out of place in such a medium. Instead he strives to make a sort of a community newspaper out of his company's publication for the express benefit of the community of business people who use or can use his merchandise.

Rather than using the space in this publication to ballyhoo the merits of the products he has to sell, Messner devotes its pages largely to personal items about his customers, such as announcing their blessed events and reporting their fishing trips. Interspersed among these items are jokes or bits of homely philosophy drawn from any available source, and—most importantly—items and pictures designed to spread the news about people who have recently purchased equipment from the Messner firm. A recent issue of "Facks 'N' Figgers," for example, carried no less than 31 such items.

News for the paper is gathered by salesmen in the field and by store personnel who talk to customers as they walk in or call in. Salesmen shoot their own pictures for the paper with simple cameras. "The photography usually is lousy," Messner freely confesses, but we can't reasonably expect our fellows to be expert photographers as well as top-notch salesmen. However, they usually do well enough to get by. Besides, sometimes the customers themselves will have pictures taken and supply them to us for use in the paper.

"The sales value of this company publication can't be overemphasized," Messner declares. "People like to see their names and faces in print, even in a little paper like ours. While this publication isn't circulated among their neighbors at home, it does reach many of their business neighbors.

"After all, most people are proud of the business they conduct. Whenever they improve their facilities or their operations they like to have other people know about it. Besides, they realize that our 2500 circulation represents many potential customers of theirs, and often—all other things being equal—such publicity can be the deciding factor in swinging a sale."

Paper Is Potent Sales Tool

The Refrigeration Equipment Co. house organ proves to be a potent sales tool even when no salesman is present. When restaurant owners, for instance, read about how one local eating establishment has added some new refrigerated equipment, they immediately start thinking in terms of the needs of their own places. In some instances they may learn of applications they didn't even realize were possible. Thus other potential sales are born.

One diner operator, for instance, bought a window-type air conditioner from the Messner firm. Because space was at a premium inside the diner, a hole was cut in the back wall and the unit was mounted entirely outside the building. The salesman, proud of the job, shot a picture of the installation wihch was published in the house organ. Within a month after this issue was mailed out, the firm chalked up six more sales involving the same type of installation for customers who never before had realized that their cooling problems could be solved in this manner.

Advertising Plus Public Relations

Typical of the little news items carried in the house organ which fulfill both an advertising and a public relations function are these:

"Union Upholstery Co. in Jefferson has just purchased two Carrier air conditioners for its offices. Cool and efficient employees from now on."

"Check with Eddie Callies of Eddie's Grocery in Sun Prairie and find out what a Tyler multi-deck dairy case can do for you."

"We are proud to announce that we have completed installation of the air conditioning equipment in the operating room at Fort Atkinson Hospital."

It is important to note that in each of these typical items a brand name was publicized, or a type of job, or both. The variety of these items indicates to readers of the house organ the diversified nature of Messner's customers, as well as advertising the types of equipment that the firm handles.

"Many times," Messner reports, "prospects who come in to talk about some new equipment will pull out a copy of this little paper, point to some particular news item, and say, for instance, 'I want this in a

Here's the Full Cycle of a Sale — House Organ Style

SALES VALUE of the paper shows (right) when customer comes in to shop for piece of equipment like that bought by a competitor and publicized in the house organ. Gary Messner, son of the firm's president, follows up (below) by writing item on this new sale for the paper's next issue.

NEWS ITEM obtained by Gary is prepared for publication (right) by Chuck Schnetzler and sales manager Don McNearney. Floor manager Don Messner and his father, Ray, check the completed issue (below) in which this news item appears, ready to promote still another sale.

INGENUITY is one-of the prime assets of any serviceman. As an example, Mike Holland shows how you can combine a photo reflector with a portable stand to provide plenty of . . .

Light Where You Need It

MUCH of the nuisance and inconvenience involved in trying to work in confined spaces while making shop repairs on refrigeration equipment has been eliminated by Mike Holland, head of Refrigeration Equipment Co., Greeley, Colo. There's no mystery about this operation. Holland simply uses a portable post-type stand and a clamp-on photographic floodlight reflector to supply all the illumination he needs in just the right places.

The stand itself consists simply of an adjustable steel post mounted on a castered base which can be readily rolled from place to place or locked securely to remain at one point if desired. The lamp reflector used is equipped with a spring-type clamp which can be easily fastened at any point on the vertical post. An extra 25′ length of extension cord is kept coiled on a pair of hooks fastened to the base of the post so that the light stand can be moved to any section of the service shop without the necessity of moving the plug from one electrical outlet to another.

"A lot of our work is done on commercial cases and other types of equipment in which the refrigerating system is located in some sort of a recess in the cabinet," Holland explains. "Before we built this rolling light stand it usually was necessary for us to resort to a flashlight in order to see what we were doing while working on these units. Now, however, we can concentrate the light where we need it most, and both hands are kept free for the use of tools."

larger size.' This really brings home to us the potent advertising value of this news sheet. We use space every day in the local newspaper, and we feel that we can't do without that type of advertising, but for direct sales results it can't hold a candle to our own little house organ."

During the first four years of its existence, the paper was sent only to regular customers of the Messner firm. In the past year, however, Messner decided to capitalize on the growing amount of floor traffic attracted by his restaurant supply division, so he developed a "gimmick" to help him get the names of these drop-in customers on the house organ's mailing list.

The idea was simple enough. He merely set up a display table on

MAILING LIST of Messner house organ is built by adding new names obtained through a monthly contest gimmick.

which to highlight a monthly drawing offering some traffic appliance, such as a coffee maker, as a prize. A registration book is provided which must be signed by individuals wishing to qualify for the monthly prize drawing. A stack of the latest issue of the firm's house organ also is kept on this table. Each month the registration book is checked for new names which are promptly added to the publication's mailing list.

"So far we've picked up about 500 new prospect names this way," Messner reports. "What's more, the prize contest itself has generated a lot of interest. Each month the name of the winner is announced in the house organ, and

Continued on page 71

No need for knees when BENDING *

Save your energy! Use dead-soft DRYSEAL. You can make the most intricate bends with your fingers . . . no tools of any kind required. And its ductility and special temper make it extremely easy to flare for compression fittings without danger of splitting. To make sure you get a tube that is free of even the slightest trace of dirt or moisture we double crimp DRYSEAL on both ends, at the factory. This is the final step in manufacturing, immediately following a special cleaning and dehydrating operation, which keeps dirt and moisture from entering the tube. This double crimping does not interfere with installation for it is made in such a way that it permits DRYSEAL to be passed through any opening large enough for the tube itself. Tube sizes—⅛" to ⅞" O.D. The DRYSEAL carton, attractively designed for easy identification, contains one 50-foot coil . . . is easier to handle, light weight, economical and sturdily made to assure protection of the tube in stock and in transit.

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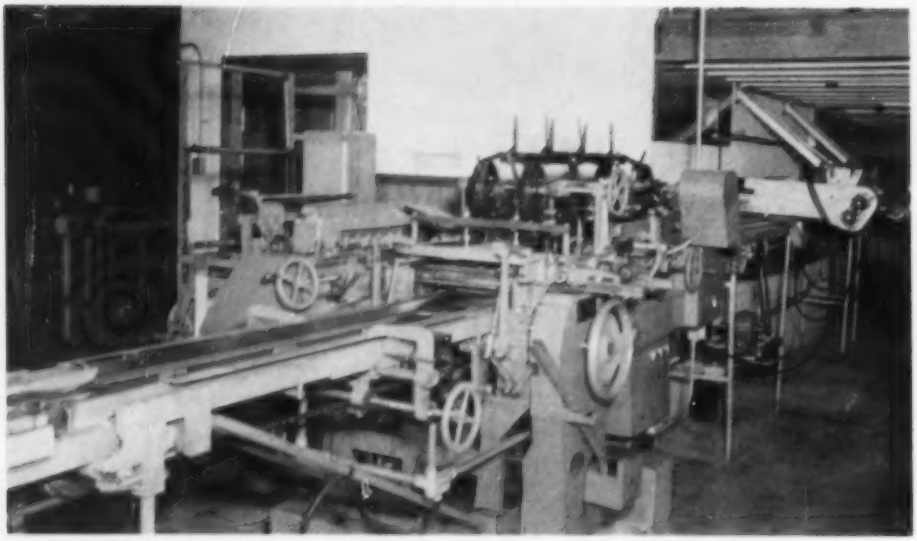
* **REVERE**

DRYSEAL

COPPER REFRIGERATION TUBE

Circle No. 33 on Reader Service Card



INTEGRATED INTO THE PRODUCTION FLOW at the far end of this packaging line is a continuous package freezer which makes it possible for this plant to employ the most modern mass production techniques in . . .

FREEZING FISH STICKS

FROZEN fish sticks are well on their way to becoming one of the best selling items in the frozen food field. And one of the factors that has made possible the large scale production required to satisfy this growing demand is the type of sub-zero processing equipment which has been installed at the plant of Sea Pak Corp. on St. Simons Island near Brunswick, Georgia.

In this modern manufacturing establishment, a York continuous package freezer was installed as an integral part of the production line along which the fish sticks steadily progress from the preparation and cooking area, through the packaging apparatus, and into the low temperature storage room.

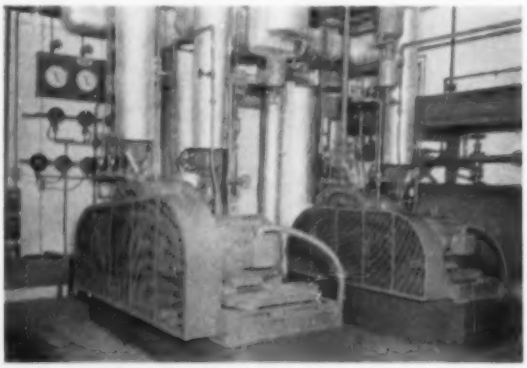
Before examining the details of this equipment, however, it is important to know something of the origin of fish sticks and of what happens to them before they reach the St. Simons plant.

This fascinating story of refrigerated food production starts when cod caught in the icy waters of the North Atlantic are filleted and frozen in 17½-pound blocks in the Sea Pak plant at Fortune, Newfoundland. These blocks are then shipped to the St. Simons plant for processing.

Here bandsaws cut the frozen fillets into slabs which are fed into a reciprocating cutter where a knife operating at a rate of 50 strokes per minute chops off 12,000 fishsticks per hour. These sticks, which measure 3½ x 7/16 x 13/16", fall onto a sanitary rubber belt on which they travel past inspectors and under two falling streams of batter before entering a rotating breading cylinder.

A vibrator removes excess breading, after which the sticks move along a wire mesh inspection belt and into the precooker, where a wire rod conveyor carries them

Continued on page 70



MACHINERY ROOM of the Sea Pak plant houses these multicylinder compressors which provide the necessary refrigeration capacity to accomplish the frozen food processing job.

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Circle No. 34 on Reader Service Card

PART 2

TIME CONTROLS

Their applications in the refrigeration and air conditioning field

by Tom Morrison

Manager, Refrigeration Div.
Paragon Electric Co.

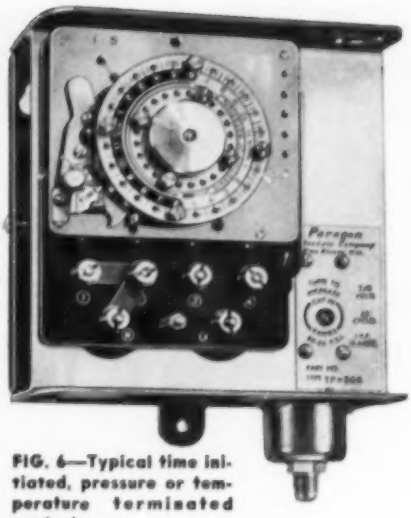


FIG. 6—Typical time initiated, pressure or temperature terminated control.

FIG. 7—Switch similar to that shown above, with solenoid used in place of pressure switch.

ALL the controls described in Part 1 of this article (see last month's issue) are "pure" time controls. In other words the defrost cycle and frequency of operation of the defrost cycle is purely related to time. The frequency of shutdown during a 24-hour period is selected from actual experience or by recommendation of the manufacturer.

The problem of the service man is then how long to defrost. The time necessary to defrost an evaporator will vary considerably with ambient temperature conditions, relative humidity conditions, type of load and the design of the coil and equipment. As a result, the shut-down period is difficult to adjust and in most cases must be changed with the seasons.

The next step in providing complete automatic controls for defrosting was reached in the development of time initiated, pressure or temperature terminated controls. A specimen of this particular style of a time control is illustrated in Figure 6. This is a time initiated, pressure terminated unit. It has a similar type of dial to the others in that it is sub-divided into 24 equal segments relating to the 24 hours of the day, but in addition to that it has a pressure bellows as an integral part of the unit.

When a defrost cycle is called for, a pin is placed in the dial at the proper time. This initiates the defrost cycle. However, the pressure bellows is adjusted to a pressure at which the ice has melted off the coil. When this pressure has been reached, the pressure switch terminates the defrost cycle; therefore, the term "Time Initiated-Pressure Terminated".

The defrost cycle is not related to time but to the buildup in pressure. It is definitely dependent on a number of things; as you can see it is automatically adjustable. The defrost cycles will vary as the load on the evaporator varies.

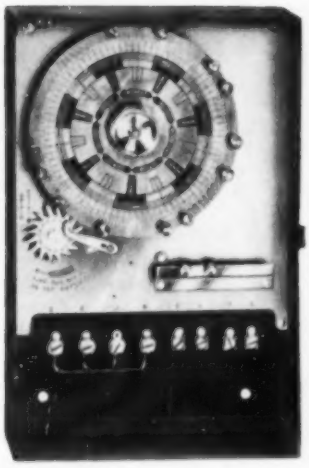


FIG. 8—Seven-day switch which is ideal for regular weekly schedules of equipment operation.

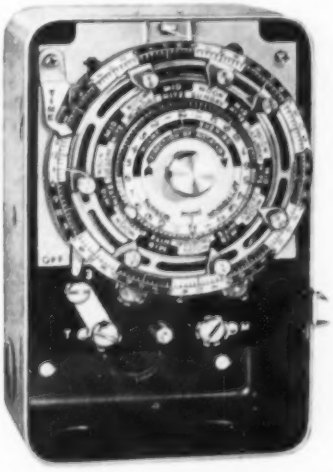


FIG. 9—New type of control employing dual-dial construction to allow for different "off" periods every day, thus allowing for considerable variation in operation.

With this type of arrangement, the control also offers a skip-defrosting period. In other words, if the equipment does not require defrosting by virtue of the fact that pressure already has built up to the defrost termination point when a defrost period is called for, the control will immediately trip out and return to the refrigeration cycle, and thus skip defrosting this particular cycle.

The control also has a protective feature. This is provided by the inner row of pins (as illustrated in Figure 6) which allows a time cycle which over-rides the pressure cycle in period of 60 minutes or 45 minutes. If a condition should arise whereby the pressure bellows is not actuated and terminates the defrost cycle, the timer dial will terminate the defrost cycle mechanically by the fail safe pin.

This fail safe pin is sometimes referred to as a positive return, as it will guarantee that the equipment will go back to a refrigeration cycle. This fail safe system will also solve conditions in which the pressure bellows may not rise or shut off at all or a condensing unit is not operating. These controls have been used on hot gas systems, compressor shut-down systems and, most popularly, on the electric heat types of defrost systems.

Figure 7 shows a similar type of unit except that a solenoid is used in place of the pressure switch. This solenoid is the agent that actually terminates the cycle. This switch gives the same operation as the time initiated, pressure terminated switch in Figure 6, except that it is necessary to provide either a pressure switch or a thermostat placed at some optimum point and connected to the solenoid to duplicate the time initiated and pressure terminated condition.

Figure 7A shows a wiring diagram for this unit as used on an electric heat system. The "defrost limit switch" is that external pressure control or thermostat that terminates the defrost cycle on pressure or temperature rise.

The advantages of this unit over the other control is that it allows the contractor or serviceman a free choice of the termination agent. The termination agent may be either a pressure switch or a thermostat, whichever gives the optimum performance. It also allows remote control of the system, as two wires are used as the connecting medium rather than copper tubing which is necessary in the time initiated pressure terminated control.

These controls have been developed in switch arrangements for all types of defrosting except water spray defrosting. The many advantages of these types are easily discernible and today many of them are being used to replace the momentary contact types.

The air conditioning field has also used time controls for many applications. Primarily these have been used for automatic control of ON or OFF operations. Figure 8 illustrates a seven-day switch which is used widely in the commercial field.

Continued on page 70

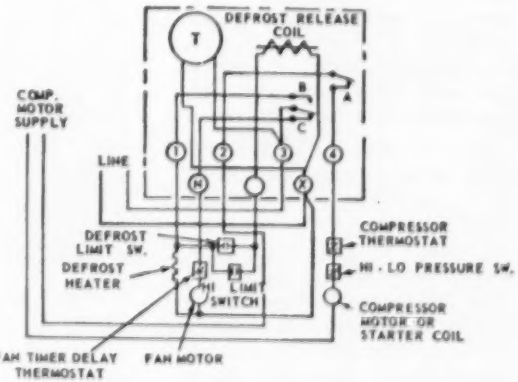


FIG. 7A—WIRING DIAGRAM for control shown in Fig. 7, as used on an electric heat system. The "defrost limit switch" is that external pressure control or thermostat that terminates the defrost cycle on pressure or temperature rise.

COMMERCIAL REFRIGERATOR

SALES NEWS

NCRSA Elects Taylor President; San Francisco is '56 Meeting Site

SIDNEY G. Taylor, head of Taylor Refrigerator Co., Des Moines, Iowa, has been handed the responsibility of directing the affairs of the National Refrigerator Sales Association for 1956.

Formerly 1st vice president of the organization, Taylor was elected president of NCRSA at the close of the group's ninth annual convention held last month at the Traymore Hotel, Atlantic City, N.J., in conjunction with the 9th Exposition of the Air-Conditioning and Refrigeration Industry.

Elected to serve with Taylor during the current year were the following officers: 1st vice president, S. W. Davis, Jr., S. W. Davis, Jr., Inc., Greensboro, N. C.; 2nd vice president, Harry A. Hattenbach, Hattenbach Co., Cleveland, Ohio; and treasurer, Milton I. Schwartz, S. & M. Schwartz & Co., New York City.

In accepting the treasurer's post, Schwartz left open his term on the board of directors which was not slated to expire until the 1956 meeting. Named to fill this unexpired year of his term was Dudley M. Cawthon, Dudley Cawthon, Inc., who had just completed his own three-year term on the board.

Three more new directors also were elected to replace those whose terms expired at this meeting. These new directors, whose terms will expire in 1958, are: E. B. Ward, Baker-Ward, Inc., South Bend, Ind.; Fred E. Jacob, Jacob Market Equipment, Los Angeles, Calif.; and Phil Erb, Phil Erb Refrigeration Co., Springfield, Mo.

San Francisco, Calif., has been selected as the site of the association's 1956 meeting, but the definite date of this meeting has not yet been determined.

Cashing in on the crowds of visitors attracted by the industry exposition, NCRSA chalked up a new registration mark of 191 for its annual meeting. Furthermore, nine new distributor members of the association were enrolled during the convention sessions. These new member firms are:

Nelson's Refrigeration & Fixtures, Inc., North Hollywood, Calif.; E. S. Matthews, Inc., Spokane, Wash.; Price Refrigeration Co., Washington, D.C.; Creco Advertising Associates, Inc., Louisville, Ky.; Louis Fox, Inc., Food Store Engineers, Washington, D.C.; Kaylor Refrigeration Co., New Philadelphia, Ohio; Edward Milner Co., Ltd., Toronto, Ont., Canada; Monroe Food Machinery, Inc., Spokane, Wash.; Woodward-Warren Refrigeration Co., Inc., Charlotte, N.C.

At the conclusion of the meeting, former president Frank Stella, acting in behalf of the association membership, presented retiring president George Wiedemer with a suitably inscribed clock and pen set for his desk in appreciation for his services to the organization.

Nine distributor members of the organization and five representatives of manufacturing firms holding associate memberships in NCRSA joined forces with four experts from allied fields to present an interesting and stimulating educational program which held the attention of members throughout the two-day meeting.

Subjects discussed ranged from "The Salesman's Wife" to "The Future of Frozen Prepackaged Meat". A panel-type discussion covering the broad topic of "Making the Sale" included specific presentations on "Developing Prospects", "Preparing and Presenting the Layout and Quotation", "Concluding the Sale", "Installing the Equipment", "Store Opening", and "Was It Worthwhile?". Each panel speaker later was subjected to open questions from the floor which sparked considerable informative discussion.

Condensations of many of the talks delivered at the meeting will be presented in subsequent issues of COMMERCIAL REFRIGERATION & AIR CONDITIONING.

GUIDING NCRSA FOR 1956 will be these officers, directors, and past presidents. Figure in parentheses following name of a director indicates year term expires. Seated, from left: M. I. Schwartz, New York City, treasurer; S. W. Davis, Jr., Greensboro, N. C., 1st vice president; S. G. Taylor, Des Moines, president; Marie H. Lawton, executive secretary; H. A. Hattenbach, Cleveland, 2nd vice president. Standing, from left: Russ Maintain, Woburn, Mass.; George Schoenbacher ('57), Chicago; C. S. White, Cincinnati; R. J. Wischusen, Jersey City; G. F. Wiedemer, Rochester, N. Y.; I. W. Shell, Chicago; R. H. Winther ('56), San Francisco; D. M. Cawthon ('56), Miami; F. E. Jacob ('58), Los Angeles; E. B. Ward ('58), South Bend, Ind.; S. W. Bushnell ('56), Seattle; F. D. Stella, Detroit; Phil Erb ('58), Springfield, Mo. Not present when photo was taken were directors J. S. Lipack ('57) and F. W. Owen ('57), and past president W. C. Bader.

1956 SEEN BEST YET FOR AIR CONDITIONING

The air conditioning industry in 1956 will break all previous records for the seventh consecutive year with total sales at retail of about $3.2 billion, predicts Cloud Wampler, chairman and president of Carrier Corp.

The biggest percentage growth will again come in the residential field, with central air conditioning installations in homes increasing to about 200,000 for the year at a retail value of nearly $1/3 billion, Wampler said.

By 1960, he said, central comfort systems will be installed in well over ½ million homes annually, and by 1965 this will have increased to 1,150,000 a year with a retail dollar value of about $1¾ billion.

The Carrier executive spoke at a preview of a completely new line of "Winter Weathermaker" forced warm air heating units and of the company's 1956 room air conditioners. He forecast that:

1. The coming 12 months will be the year of the great breakthrough in air conditioning of residences with sales now beginning to affect large sections of the American public.

2. The spectacular gains in complete home air conditioning will bring profound changes in the residential heating business. The key phrase in the next few years will be "easy convertibility" to year-round comfort. "Heating is becoming simply a phase of all-season air conditioning," he said.

3. Room air conditioner sales at retail for the industry jumped to about 1,400,000 units during 1955. He predicted that, with normal weather, sales would be about the same or only slightly higher in 1956.

The 1956 retail estimate for the industry was broken down by Wampler as follows:

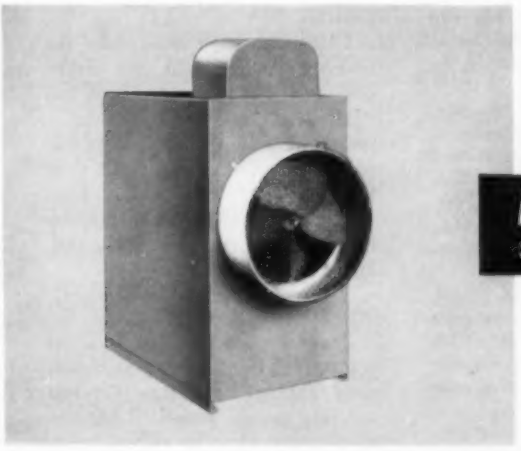
Room air conditioners, $435,000,000; complete home air conditioning, $312,000,000; commercial packaged air conditioning, $189,000,000; built-up air conditioning and refrigeration systems of all sizes, $1,043,000,000; residential forced air furnace installations adaptable to air conditioning, $638,000,000; all other, $565,000,000.

He said that the $3.2 billion estimate takes into account the current growing together of the heating and the air conditioning industries. On the same basis industry 1955 sales were $2.9 billion.

ERNIE TRAMPOSH IS NEW ARW PRESIDENT

E. L. Tramposh, of Refrigeration Equipment Co., Kansas City, was elected president of Air Conditioning and Refrigeration Wholesalers (ARW) during the 20th annual meeting of the organization in Atlantic City.

New ARW vice president is Irving J. Fajans, of Atena Supply Co., New York City. W. J. Hieber, of Refrigerative Supply, Inc., Seattle, was elected secretary, and C. G. Koopman, of Supply Distributors Corp., Boston, was elected treasurer.



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CONTRACTORS

NEWS • ACTIVITIES • PLANS

TV Film Would Help in Explaining Air Conditioning to Would-Be Buyers

WITH proper industry interest and support, the National Better Business Bureau is considering the production of a TV film on air conditioning as a consumer educational project, Victor H. Nyborg, president of the Bureau, told members of the Refrigeration & Air Conditioning Contractors Association at their recent annual convention in Atlantic City.

The film would be produced with the cooperation of the industry, and made available to TV stations for use as a public service feature.

What Film Would Show

In broad outline, the film would proceed from an explanation of what makes you feel hot, and the effects of this on your disposition, efficiency and well being, into a graphic demonstration of what air conditioning does to the air (cooling, dehumidification, air cleaning and circulation). With this basis established, it would then move into the details of the various kinds of residential cooling equipment (room coolers, central systems, etc.) and the things you need to know to select a system suited to your needs and to get a satisfactory, economical cooling installation.

"The various technical factors which must be understood for an intelligent comprehension of what air conditioning is all about will be explained—as graphically as possible—in short takes distributed throughout the film, as an understanding of each factor becomes necessary to the further development of the theme," Nyborg said. "Thus, the distinction between temperature and humidity, and the fact that both produce discomfort, will be clearly established in the introductory section, following which—while the explanation is still fresh in the audience's mind — the section on how an air conditioner works will begin by showing how it removes heat and moisture from the air.

"The explanation of the all-important Btu, on the other hand, will not occur until the latter part of the film, and will begin, not with the question of cooling *capacity*, but with an explanation of cooling *load*.

"Thus the practical need for the Btu yardstick will be established before the unit itself is discussed, and the yardstick applied to the sources of heat-gain the air conditioner must combat (solar heat, occupancy, equipment and lamp load) before it is applied to ratings of air conditioning equipment.

Explaining Load Problem

"In this way, it will be possible to make a series of direct connections between the load problem as it confronts the consumer and capacity standards as established by the industry, proceeding from the relatively simple case of the room cooler towards the more complex problems involved in house-wide air conditioning.

"In the same way, the question of adequate wiring, proper duct-work and outlets, and the various methods of getting rid of the heat pumped out of the house by the conditioning equipment will be left to the last, when the audience has been prepared for such questions by the discussions of load and capacity.

"This approach will make the necessary educational part of the film fairly painless and not too obtrusive, and will provide a means for giving considerable emphasis to industry standards near the end after interest has been won and sufficient understanding to appreciate the need for standards created."

"Danger Signals" Cited

Proposal for the educational project, Nyborg said, was developed during discussions between industry people and BBB officials concerning what he called "danger signals" that might hamper the healthy growth of air conditioning.

"I would say the greatest deterrent to your growth today is the ignorance on the part of your prospective customers as to what "air conditioning actually is," Nyborg said. "Of greatest importance, therefore, is a program of consumer education—a project in which the Better Business Bureau can be of help.

"For the most part, people know

CAWTHON HEADS RACCA OFFICERS FOR 1956

Dudley M. Cawthon, Miami contractor, was elected president of the Refrigeration and Air Conditioning Contractors Association national organization at the annual meeting in Atlantic City during the ARI Show.

William D. Moody, Houston, was elected first vice president; Harvey O. Miller, Chicago, second vice president; Lee J. Quinn, Cincinnati, recording secretary; Harvey W. Hottel, Silver Spring, Md., treasurer; and Paul B. Hughes, Jersey City, sergeant at arms.

Cawthon succeeds A. M. Palen, St. Paul, who as immediate past president remains on the RACCA board of directors. Ray W. Kromer will continue as the executive vice president.

Directors, in addition to the officers, are: Joseph A. Marchase, Pittsburgh; George T. Howe, Chicago; Lawrence Gardella, Cleveland; O. B. Lund, Havre, Mont.; Charles Caccamo, Tampa, Fla.; Armand Cowan, Miami, and R. B. Garlock, Lansing, Mich.

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about air conditioning because of their contact with it in theatres, stores and offices. They are pleased with their experiences. They know it"s good. They want it for their homes.

"These people have received their demonstrations generally under ideal conditions — from installations that have been purchased by experts and installed by experts. Both the buyer and the seller knew his business.

"But this is not true when we look at the rapidly developing home air conditioning market. You have literally millions of prospective customers. . . . What do they know about your product and your services? The vast majority know only the end result that they hope to get. . . . They know nothing about capacities, loads, engineering, surveys, cost comparisons or installations by competent, reliable workmen who are qualified to perform their services.

"I am sure that you recognize also that there are so-called sales and service people in this field of yours who don't know the answers. Maybe it's the man who handles air conditioning as a side line or maybe he's a newcomer—the type that's attracted to a new business for a year or two but he doesn't belong and usually he doesn't stay very long. During his time in business, his poor serivce can give air conditioning a bad name and he can demoralize your market."

WATER USAGE CONTROLS CONSIDERED IN OMAHA

Regulation of the use of water for air conditioning purposes is being considered by directors of the Omaha, Neb., metropolitan utilities district. This fact was disclosed during a recent meeting at which the board appropriated $1,528,000 for planning and construction of additional water supply facilities.

General manager Ralph H. Trester told the board that air conditioning was responsible for water consumption in Omaha reaching levels which had not been expected until the 1960's. He claimed that air conditioning installations not employing any means of water conservation accounted for 20 to 30 million gallons of water a day during peak periods.

Possibility of instituting a high fee for operation of such systems, in addition to the water cost, was discussed. While definite action was deferred pending further study, a fee of $40 a ton per year was considered.

While some sentiment was expressed to ban the use of air conditioning systems employing no water conservation medium, indications were that the high fee plan would be given preference. Owners of such systems would be given a reasonable time in which to comply with the new regulations.

FLORAL CITY HEATER CO. PURCHASED BY USAIRCO

United States Air Conditioning Corp. has purchased the 72-year old Floral City Heater Co., of Monroe, Mich. The move marks the entry of Usairco into the warm air heating field. Floral City Heater will be a division of Usairco.

Brand new idea

...in testing gauges

It's the new "Serviceman" maximum pressure gauge . . .

Another example of Marsh coming up with an ingenious idea to make refrigeration servicing easier and better!

This time it's a new type of maximum pressure gauge — a gauge that shows top pressure with extreme accuracy, whether you make a short test or leave it over night.

The secret is a check valve that traps the pressure in the bourdon tube until you release it with that handy push button. Then the pointer jumps back to zero. It's so convenient and useful you'll wonder how you ever got along without it!

This Marsh innovation is incorporated in the highly accurate deluxe "Serviceman" testing gauge with 400 lb. scale . . . dressed up in a handsome, polished brass case with a knurled screwed ring which gives quick access to the Marsh "Recalibrator" to keep it always accurate.

This check valve does the trick

See it and other great Marsh products at BOOTHS 737 & 738 Atlantic City Exposition Nov. 28—Dec. 1

Write for facts or see your wholesaler

MARSH INSTRUMENT CO.

Sales affiliate of Jas. P. Marsh Corp.

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Marsh Instrument & Valve Co. (Can.) Ltd. 8407 103rd St., Edmonton, Alberta, Can.

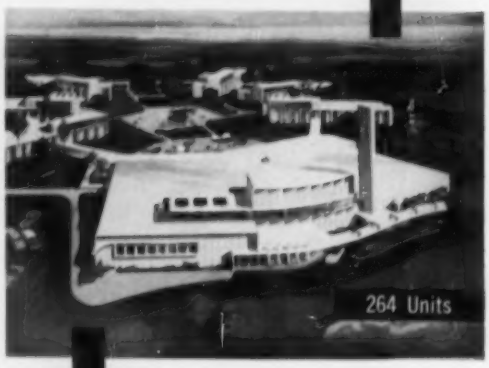
MARSH REFRIGERATION INSTRUMENTS

GAUGES • WATER REGULATING VALVES • SOLENOID VALVES • HEATING SPECIALTIES

Circle No. 36 on Reader Service Card

New! Really Compact!

drayer-hanson
SPOTAIRE-LRC
Air Conditioning



. . . already set for new Lady Luck Hotel, Las Vegas
* rendering courtesy Architect Homer Rissman

LRC Basic Unit

LRC Concealed Cabinet

No individual-room equipment for complete air conditioning of multi-room structures allows such design freedom for the architect . . . achieves such "pin-drop" quietness of operation!

Eye-opening . . . new D-H Spotaire LRC's require just 11½" head-room from ceiling; provide your best answer for low-cost, individual room air conditioning. 3-speed controls. For cooling, heating, dehumidifying, filtering. Old or new construction.

There's also a full LRC story — installation — operation — no-maintenance — you should know about . . .

Request catalog L.P. 5.220

d-h SINCE 1910

drayer-hanson
INCORPORATED

3301 Medford Street • Los Angeles 63, California
(Subsidiary of National - U.S. Radiator Corporation)

Circle No. 37 on Reader Service Card

USEFUL BULLETINS • BOOKLETS • CATALOGS

IMPORTANT DESIGN ADVANCES recently made in its line of rerated motors are explained with a wealth of cut-away illustrations and diagrams in a new 16-page, full color catalog (N-100-R) of Howell Electric Motors Co. Booklet outlines construction and operation features, gives installation information, and provides dimensional and other technical data.

Circle No. 81 on Reader Service Card

COMPLETE LINE of vacuum and liquid pumps, air brake equipment, and hydraulic motors, controls, and pumps are pictured and described in a 16-page color brochure (No. 1102) offered by New York Air Brake Co. The booklet is abundantly illustrated with installation photographs showing a wide range of industrial applications.

Circle No. 82 on Reader Service Card

PORTABLE GAS DETECTOR is described and illustrated in a new catalog sheet (G-755) released by Johnson-Williams, Inc. Literature discusses product features, operating principle, and gives complete specifications and prices. Photographs show device in use and illustrate various accessories.

Circle No. 83 on Reader Service Card

SOLVENT COOLING EQUIPMENT for dry cleaning plants is pictured and described in a 12-page illustrated catalog issued by Vic Cleaning Machine Co. Printed in 3 colors, the booklet outlines product advantages, construction and design features, specifications, and capacities for its line of heat exchangers, regulating valves, water chillers, and solvent coolers.

Circle No. 84 on Reader Service Card

HIGH AND LOW TEMPERATURE CABINETS are described and illustrated in a new 4-page bulletin prepared by Webber Engineering Corp. The 2-color folder describes complete line of 1 to 45 cu. ft. cabinets and lists product design and construction characteristics as well as dimensions and other specifications.

Circle No. 85 on Reader Service Card

"MIGHTY MOVERS" that resemble giant roller skates and are useful in moving heavy machinery and other bulky equipment are pictured and described in a 4-page folder published by Acorn Co. The 2-color brochure gives complete specifications, prices, and contains photographs showing product applications.

Circle No. 86 on Reader Service Card

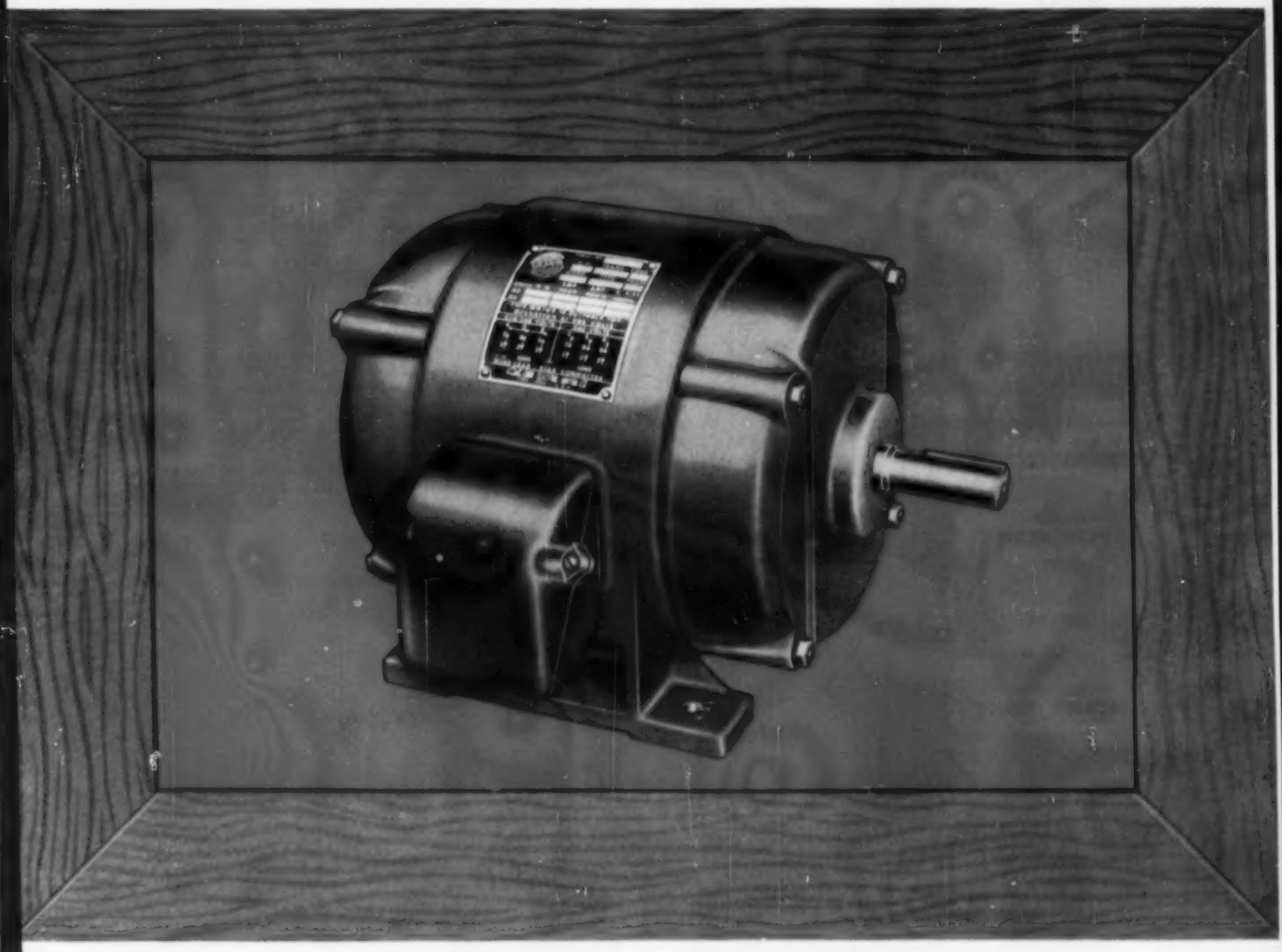
DESIGN AND PRICE INFORMATION on all types of "Thermo-Panel" plate coils is provided in a new 4-page bulletin (No. 256) available from Dean Products, Inc. The 2-color folder is illustrated with drawings and photographs and contains listing of product advantages, gives complete technical data, and outlines concise information on estimating cost of various types of unit. Pricing details are supplied in tabular form.

Circle No. 87 on Reader Service Card

(Turn to page 58 for more Useful Literature)

portrait of

A New Approach to Perfection



LIMA

New NEMA Frame Sizes

No longer is it necessary for the designer to compromise motor power or performance to meet size and weight limitations!

Now, Lima has in production all ratings in new NEMA frame sizes 182, 184, 213 and 215—with the 254U through 326 frames following on an accelerated schedule.

If your application requires greater efficiency in a smaller size with less weight, better protection and longer service-free life . . . then these new Lima Motors have been designed for you! Get detailed information from your Lima Representative now. If he is not already calling on you, his name and address will be found in the following Trade Directories: *Thomas' Register, Mac Rae's Blue Book,* or *Conover-Mast Purchasing Directory.*

Of course, the former NEMA frame sizes 66 to 505 (⅓ to 150 H.P.), incorporating the latest advances in motor design, will remain in production.

THE LIMA ELECTRIC MOTOR COMPANY, 5279 Findlay Road Lima, Ohio

Representation throughout the U. S., Canada and abroad

FIRST . . . FOR MOTORS . . . DRIVES . . . SPEED REDUCERS

NEW
UNIFLOW WATER COOLERS . . .

NOW IN BEAUTIFUL PEARLTONE GREY WITH YOUR CHOICE OF 6 TOPS

COLOR KEYED TO YOUR PROSPECT!

FREE *Full* COLOR BROCHURE . . . of the new COMPLETE line of Uniflow Water Coolers.

UNIFLOW . . . a pioneer builder of water coolers for over 24 years . . .

UNIFLOW MANUFACTURING COMPANY
EAST LAKE ROAD, ERIE, PENNSYLVANIA

Circle No. 39 on Reader Service Card

USEFUL LITERATURE . . .

Continued from page 56

PIPE FITTINGS AND FLANGES made of unplasticized polyvinyl chloride are the subject of a new booklet issued by Tube Turns Plastics, Inc. The literature discusses industrial applications of the product, and includes complete specifications, installation information, pressure-temperature charts, chemical resistance tables and other helpful reference data.

Circle No. 88 on Reader Service Card

POWDER-ACTUATED FASTENINGS are pictured and described, and pertinent technical information is given in a new 8-page, 2-color catalog recently issued by Ramset Fasteners, Inc. Step-by-step photographs show device in operation, and complete range of fasteners is illustrated with full size photographs. Descriptions and line drawings of accessories and applications are also included.

Circle No. 89 on Reader Service Card

BRONZE VALVES are pictured and described in a new 28-page, complete line catalog (NVC-2) issued by Northern Indiana Brass Co. The 3-color booklet lists more than 250 different sizes and styles of valves and furnishes complete information on weights, dimensions, and shipping quantities.

Circle No. 90 on Reader Service Card

COLD FOOD SERVICE UNITS are described and complete specifications, construction details, and product features are listed in a new 8-page catalog published by Bastian-Blessing Co. Illustrations show sandwich units and refrigerated bases with refrigerated display cases or combination refrigerated and dry cases mounted on them.

Circle No. 91 on Reader Service Card

(See page 102 for Air Conditioning Literature)

Use *Stic-Klip*® for

Insulation Installation

ON AIR CONDITIONING AND VENTILATING SYSTEMS FOR COLD STORAGE PLANTS, BUILDINGS AND SHIPS.

1 TYPE B with Locking Plate
2 TYPE B
3 TYPE A
4 TYPE S ADHESIVE
5 SPRING TUBING CLIP - ¼" and ⅜"
6 HOLDING PLATE used with Type A and B
7 TYPE N with Speed Washer
8 INSERT BASE Securing Signs, Wall Cabinets, etc.

Stic-Klips permanently bind almost any insulating material to masonry, wood, metal — flat, corrugated, curved, unusual-shaped. This modern method eliminates drilling, puncturing metal — saves time and money.

For illustrated booklet on any of these applications, write Dept. CR

Stic-Klip MANUFACTURING CO.
50 Regent St., Cambridge 40, Mass.

Circle No. 40 on Reader Service Card

Nothing protects a refrigerating system like this

New Frigidaire Thuro-Drier Dehydrator

Removes up to 75% more moisture than other dehydrators of similarly rated capacity!

New, advanced bead-form dehydrating agent used by Frigidaire has far more drying ability than other commonly used dehydrating agents. Actual tests prove that its higher density makes it far more efficient.

The Frigidaire "Thuro-Drier" has many outstanding features—

- **High absorption capacity**
- **Minimum powdering or dusting**
- **Exceptionally low pressure drop**
- **Absorbs acids and salts**
- **Acts as filter as well as dehydrator**
- **Tight seal plastic end caps**

It is effective with Freon 12, Freon 22, and Methyl Chloride refrigerating systems.

See your Frigidaire Parts Distributor today—there's one near you. Always specify—always use genuine precision-built Frigidaire Parts and Accessories.

Frigidaire Precision-Built Parts and Accessories

Circle No. 41 on Reader Service Card

NEW PRODUCTS

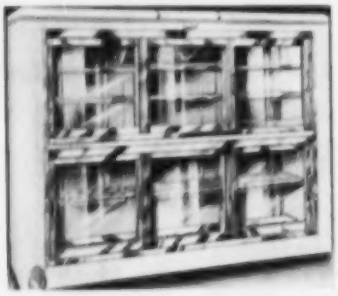
(For Air Conditioning Products turn to page 104)

Display Case

Product: "RWC" line of refrigerated wall display cases for beverage and dairy goods merchandising.

Manufacturer: Howard Refrigerator Co., Philadelphia, Pa.

Features: Line includes models 4½, 6, 8, 10, and 12′ long with respective capacities of 45, 65, 90, 120,



and 144 cu. ft. Exteriors are one piece stampings with rounded corners, ends and top, and are available with either all-porcelain or stainless steel finish. Interiors are finished in white porcelain on steel. Units have adjustable, bright plated wire shelving, fluorescent flood lighting, and stainless steel doors with hermetically sealed glass units protected against sweating.

Circle No. 121 on Reader Service Card

Adjustable Wrench

Product: Number A18R "Refrigeration Special" 8-inch adjustable wrench.

Manufacturer: Diamond Calk Horseshoe Co., Duluth, Minn.

Features: Wrench has a larger opening as its special feature. It is designed so that refrigeration servicemen can use a small 8″ adjustable wrench on ½″ brass flare nuts. Wrench retails at $2.46 and is available through refrigeration and air conditioning wholesalers.

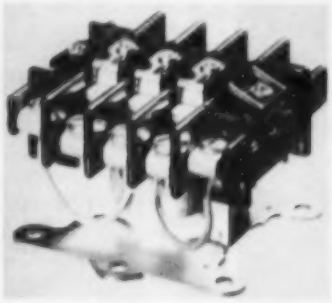
Circle No. 122 on Reader Service Card

Motor Control Relay

Product: Model 9100 magnetic control relay for across-the-line starting of motors.

Manufacturer: Leach Corp., Los Angeles, Calif.

Features: Designed for use with heating and refrigeration equipment, the new relay is a 3-pole, single throw, normally open unit. Although



small in size, it has a large current carrying capacity and is UL approved. Single phase motor load ratings are for 2 hp at 115 VAC and 3 hp at 230 VAC. Polyphase ratings are 3 hp at 115 VAC and 7½ hp at 230 VAC. Coil voltages available in this model are for 12, 24, 115, and 230 v, 50/60 cycles. Single-pole and 2-pole models with equivalent ratings are also available.

Circle No. 123 on Reader Service Card

Bakery Freezer

Product: "Bake-N-Freez" unit with new defrosting system.

Manufacturer: C. Schmidt Co., Cincinnati, Ohio.

Features: Selective automatic defrost system is claimed to save over $100 a year in electricity. Freezer utilizes "still air" refrigeration to prevent drying out of baked goods. Available in several reach-in models with capacities from 92 to 184 pans. Walk-in models are of sectional construction and available in sizes from 64 to 3,000 sq. ft.

Circle No. 124 on Reader Service Card

Vertical Storage Racks

Product: Individual storage units requiring no fastening to floor, walls or ceiling.

Manufacturer: Frick-Gallagher Mfg. Co., Wellston, Ohio.

Features: Each unit provides 9 sq. ft. of storage space for conduit or piping up to 10 ft. long. Made of steel, the racks are anchored by their own weight and become more stable as load is increased. Units are 36″ wide, 48″ deep, and 8′ high.

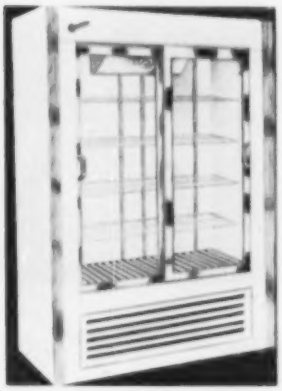
Circle No. 125 on Reader Service Card

Reach-In Refrigerator

Product: Model RB40SC reach-in refrigerator with sliding glass doors.

Manufacturer: Coldin Cabinet Co. Inc., New York, N. Y.

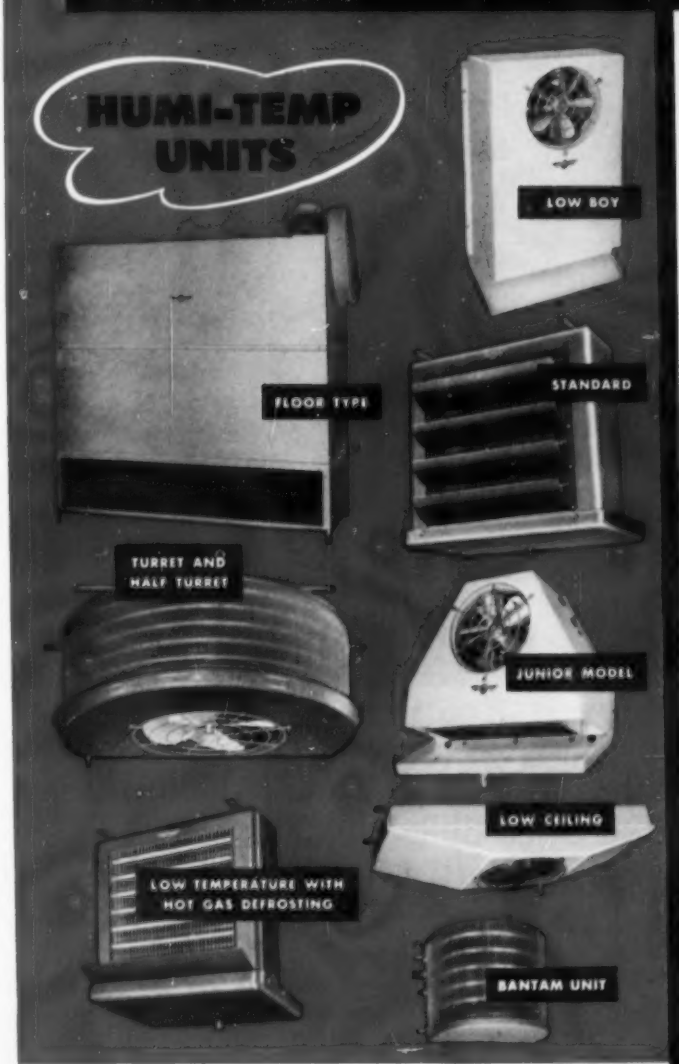
Features: Unit is equipped with

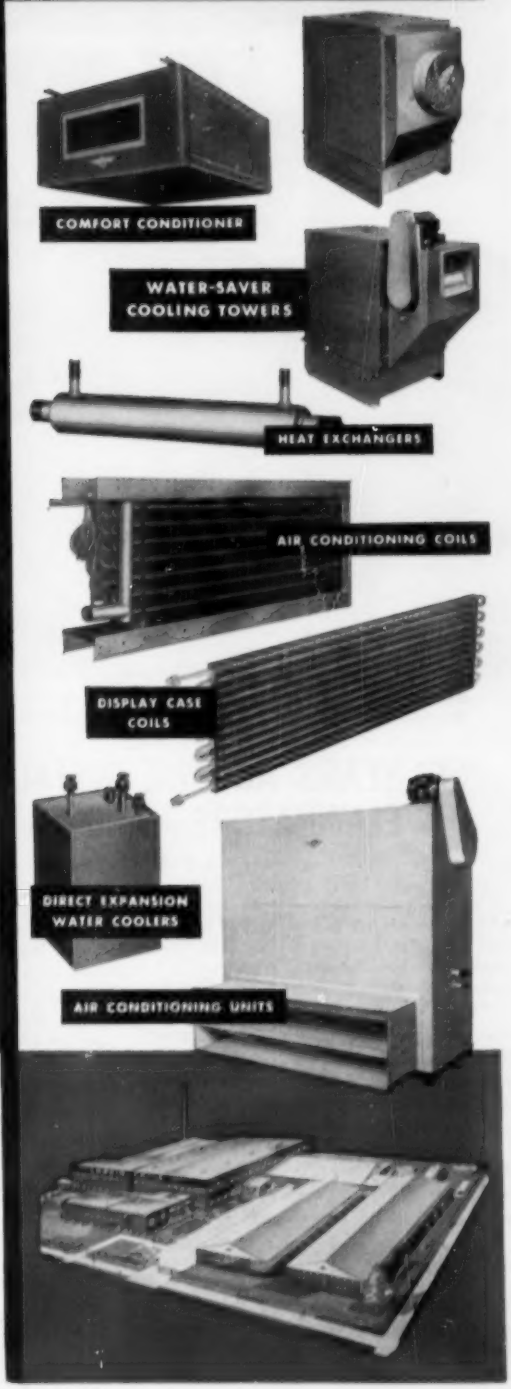


higher doors to allow greater visibility. Adjustable wire shelves provide five display levels for mass display. Cabinet has 24″ depth which makes

LARKIN IS THE LINE

Of commercial and industrial refrigeration and air conditioning equipment





Manufacturers of the original Cross-Fin Coil • Humi-Temp Units • Evaporative Condensers • Cooling Towers • Air Conditioning Coils • Comfort Conditioners • Direct Expansion Water Coolers • Heat Exchangers • Disseminator Pans

LARKIN COILS INC.

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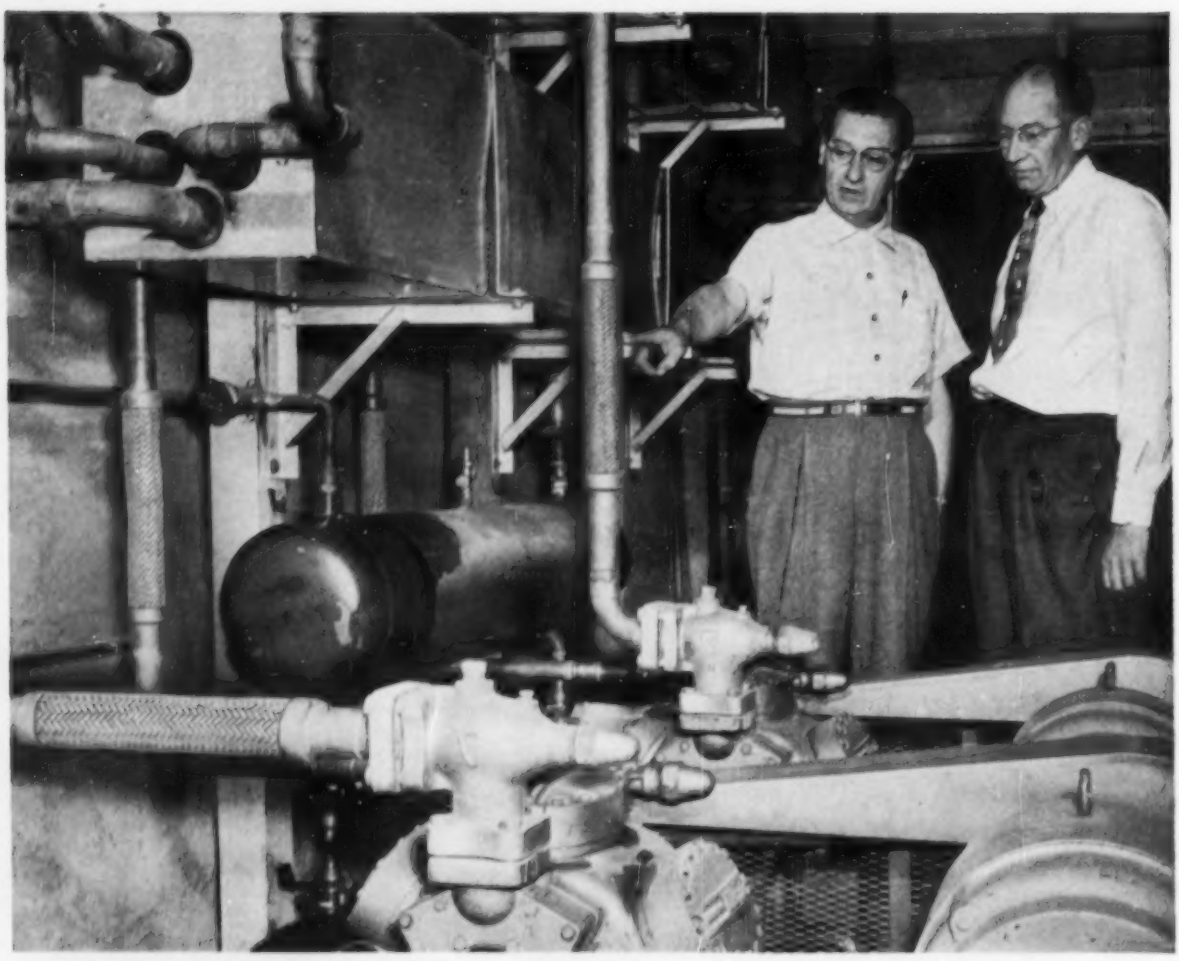
Circle No. 42 on Reader Service Card



Mr. Sloan points out American Vibration Eliminators to Mr. L. P. Akenhead, C. W. Stuart & Co. nursery, Newark, N. Y. Twelve American VE's from ½-inch to 4-inch are installed on three coolers used to hold nursery stock under refrigeration until plants are ready to be shipped.

"17 YEARS AGO WE INSTALLED OUR FIRST AMERICAN VIBRATION ELIMINATORS—AND THEY'RE STILL OUR CHOICE TODAY,"

reports **S. L. SLOAN JR., MECHANICAL AIR, INC.,** Rochester, N. Y.

"American VE's are the best and lowest cost business insurance that I know," continues Mr. Sloan. "We wouldn't install a job without them. First place...

"They mean increased customer satisfaction. Put them in and we know there's going to be no line breakage with its loss of refrigerant and merchandise under cooling. And no complaints about noise or vibration. Second...

"For a dampener – our choice is the *American* VE. In 17 years every one has been 100% dependable. It's just good business to use them."

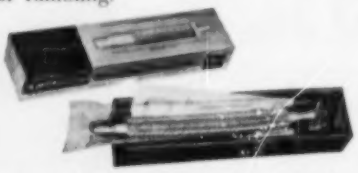
YOU CAN USE AMERICAN VE'S WITH CONFIDENCE BECAUSE –

The right metal does the job. The special tin-bronze alloy – the result of American Brass metallurgical know-how – is tailored for the refrigeration and air conditioning industries.

Double braid *where extra protection is needed.* On all American VE's 2⅛" O.D. or larger.

Clean, dry, tested, protected. Snip the end of the vapor-proof polyethylene bag and you have a factory-fresh unit to install in the line . . . clean, inside and out!

Packaged for your convenience, protection. The new boxes are sturdy, easy to open, easy to identify. No confusion or fumbling.



NOW listed by Underwriters' Laboratories through sizes 3⅝" O.D.

For descriptive folder write: The American Brass Co., American Metal Hose Division, Waterbury 20, Conn. In Canada: The Canadian Fairbanks-Morse Co., Ltd. 55197

WHEREVER CONNECTORS MUST MOVE

AMERICAN

For American Vibration Eliminators see your

ANACONDA®
DISTRIBUTOR

Circle No. 43 on Reader Service Card

it suitable for use in narrow stores and restaurants where aisle space is at a premium. Unit is also available with 30″ depth. All models are supplied with stainless steel or baked enamel exterior finish, either remote or self contained.

Circle No. 126 on Reader Service Card

Soda Fountain

Product: New 20-gallon "Fast-Serv" Soda Fountain.

Manufacturer: Bastian-Blessing Co., Chicago, Ill.

Features: Made of stainless steel, the 4′2″ model is designed for installation where space is at a premium. Unit is available with two draft arms, one for soda and one for plain water, or with patented "Cold-point" draft station with four draft arm heads. Syrup tanks have 3-gallon capacity, and unit is provided with "Johnson Flash" water cooler to insure chilled drinks. "Excelall" carbonator and illuminated, revolving "Roto-Sign" are available as optional equipment.

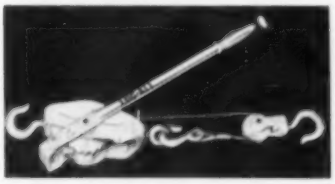
Circle No. 127 on Reader Service Card

Winch-Hoist

Product: Lightweight, 2-ton winch-hoist with 20′ of cable.

Manufacturer: Lug-All Co., Haverford, Pa.

Features: Device weighs only 15 lbs., and is provided with protective type main frame of high grade aluminum alloys, oiled-for-life bearings, stainless steel springs, and three workable hooks. Operates in any position and has built-in pulley that can be used as a "snatch block" in close quarter work. Interlocking paul system securely locks load and "safety handle" bends before unit can be overloaded. Device lifts, lowers or pulls 2 tons a distance of 10′ when used with double cable.



Circle No. 128 on Reader Service Card

NEW BUTANE-ELECTRIC COOLER ANNOUNCED

A new refrigerator that operates on either butane or electricity, is being distributed by Norco Sales Corp., Los Angeles, Calif.

Outstanding feature of the Krefft "Convertible" unit is its quick convertibility from butane to electricity. Switchover takes less than 10 seconds and involves only removal of butane exhaust tube from part at top of unit and insertion of electric plug-in element. Panel of fully automatic controls, consisting of butane temperature control, safety control button, and automatic ignition switch, is located in an easily accessible position on front of unit.

Refrigerator operates silently, having no moving parts, and is available in 2.8 and 3.9 cu. ft. models. Electrical system operates on either AC or DC current. Interior features include vitreous glass lining, four full-width shelves, and two door shelves. Vegetable crisper, drip tray, and three ice cube trays are standard equipment.

Leak Detector

Product: Compact, extremely sensitive mass spectrometer leak dedector that identifies gases by their molecular weight.

Manufacturer: Beckman Instruments, Inc., Fullerton, Calif.

Features: Device detects even the tiniest leaks in sealed compressor units, condenser and evaporative coils and valves. It is tuned to respond only to helium, a safe, inert, sampling gas with a fast instrument response. To operate instrument, helium is introduced into the system or component to be tested, or sprayed over the system's surface. If there is a leak, the helium will be detected by the indicator which is sensitive up to one part of helium in 700,000 parts of air. Audible and visible warnings instantly pinpoint location of the leak. Unit is mobile, built to withstand rugged use, has convenient table-top workspace feature, and is housed in metal cabinet.

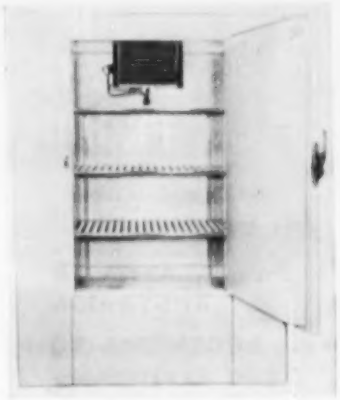
Circle No. 129 on Reader Service Card

Reach-In Refrigerators

Product: Reach-in refrigerators for small restaurants, schools, and cafeterias.

Manufacturer: Nor-Lake, Inc., Hudson, Wis.

Features: Available in models having net capacities of 18, 22, and 28 cu. ft. Refrigerators are equipped with automatic defrosting units using a special moisture evaporator that requires no drain connection. Interiors are of embossed aluminum with three adjustable stainless steel shelves. Exteriors are of stainless steel or white baked enamel over heavy gauge cold-rolled steel. All hardware is chrome plated. Units are provided with keyed locks to eliminate danger of pilferage when installed in open areas. The 28 cu. ft. model measures 71½″ high, 49″ wide, and 28½″ deep, and has a shipping weight of 615 lbs.



Circle No. 130 on Reader Service Card

Portable "Skyhook"

Product: "Magic-Pole" portable A-frame for supporting hoists where adequate means for bolstering load are not available.

Manufacturer: B. E. Wallace Products Co., Exton, Pa.

Features: Standard model handles 4000 lbs., has working height of 10′, and weighs 43 lbs. Both legs fold together, then telescope to 6½′ length for easy handling and storage. Guy line is included as standard equipment. Adjustable legs extend to required length by 6″ steps permitting setup on ramps, sloping ground or other difficult places with-

out "digging in" the uphill leg. Special "spike" type screw in base of leg prevents slip and permits setups on concrete, wood block, asphalt, soil or gravel. Complete unit is guaranteed and of rust-proof construction.

Circle No. 131 on Reader Service Card

Portable Hand Pump

Product: "Redi-Pump" portable hand pump that raises oil directly from container through a light flexible hose.

Manufacturer: Trico Fuse Mfg. Co., Milwaukee, Wis.

Features: Suction hose can be tapped directly to container, eliminating need for transferring oil from one container to another. Pump dispenses oil in any direction or angle, making it ideal for hard-to-get-at locations. No air lines needed. Nozzle is made of alloy steel to withstand damage through hard use. Device is complete with pump, 6′ of hose, suction tube, and adapter.

Circle No. 132 on Reader Service Card

Solenoid Valves

Product: Line of solenoid valves with synthetic "floating" diaphragm for improved fluid flow.

Manufacturer: Jackes-Evans Mfg. Co., St. Louis, Mo.

Features: Unit is pilot operated with no metal-to-metal contacts to wear. Operates satisfactorily with any pressure differential between 1 psi and 250 psi. Usable for control

of water, air, brine, light oils, industrial gas, Freon 12 and 22 and other non-corrosive fluids at temperatures from 0 to 225 F. Available in a wide variety of sizes, with port openings from 7/64″ to 1-1/2″ dia. Choice of screw, solder, or flare connections. Coil assemblies are same size for all valves and are readily interchangeable by addition of coil with the desired electrical connection.

Circle No. 133 on Reader Service Card

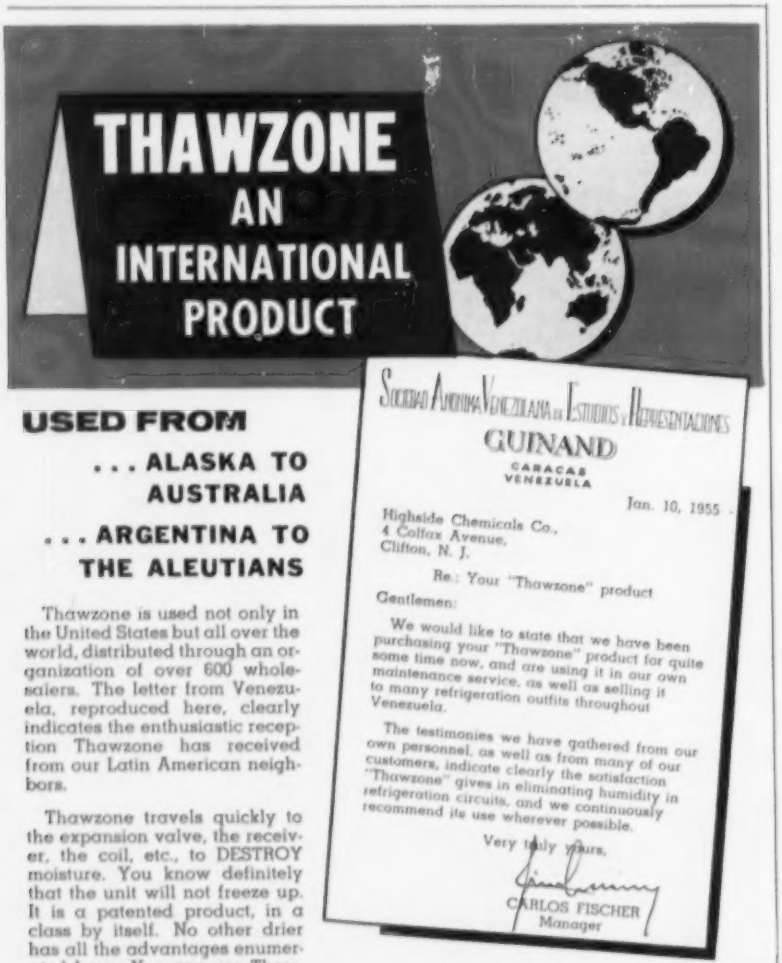
Merchandising Cabinet

Product: Glass door merchandising cabinet for ice cream and frozen foods.

Manufacturer: Sub-Zero Freezer Co., Inc., Madison, Wis.

Features: Available in four models of 16, 18½, 21, and 26 cu. ft. sizes. Single glass door is four pane Thermopane and is equipped with

heat wire which minimizes condensation and fogging, and assures clear vision display. Model 16-G (16 cu. ft.) measures 34″ long, 28″ wide, 72″ high, and has capacity for 626 10-oz. frozen food packages. Model 26-G (26 cu. ft.) measures 50″ long.


THAWZONE
AN
INTERNATIONAL
PRODUCT
SOCIEDAD ANONIMA VENEZOLANA DE ESTUDIOS Y REPRESENTACIONES
GUINAND
CARACAS
VENEZUELA
Jan. 10, 1955
Highside Chemicals Co.,
4 Colfax Avenue,
Clifton, N. J.
Re.: Your "Thawzone" product
Gentlemen:
We would like to state that we have been purchasing your "Thawzone" product for quite some time now, and are using it in our own maintenance service, as well as selling it to many refrigeration outfits throughout Venezuela.
The testimonies we have gathered from our own personnel, as well as from many of our customers, indicate clearly the satisfaction "Thawzone" gives in eliminating humidity in refrigeration circuits, and we continuously recommend its use wherever possible.
Very truly yours,
CARLOS FISCHER
Manager

USED FROM

. . . ALASKA TO AUSTRALIA

. . . ARGENTINA TO THE ALEUTIANS

Thawzone is used not only in the United States but all over the world, distributed through an organization of over 600 wholesalers. The letter from Venezuela, reproduced here, clearly indicates the enthusiastic reception Thawzone has received from our Latin American neighbors.

Thawzone travels quickly to the expansion valve, the receiver, the coil, etc., to DESTROY moisture. You know definitely that the unit will not freeze up. It is a patented product, in a class by itself. No other drier has all the advantages enumerated here. You can use Thawzone in practically any "Freon" or methyl unit.

Your wholesaler
has Thawzone.
Phone him now.

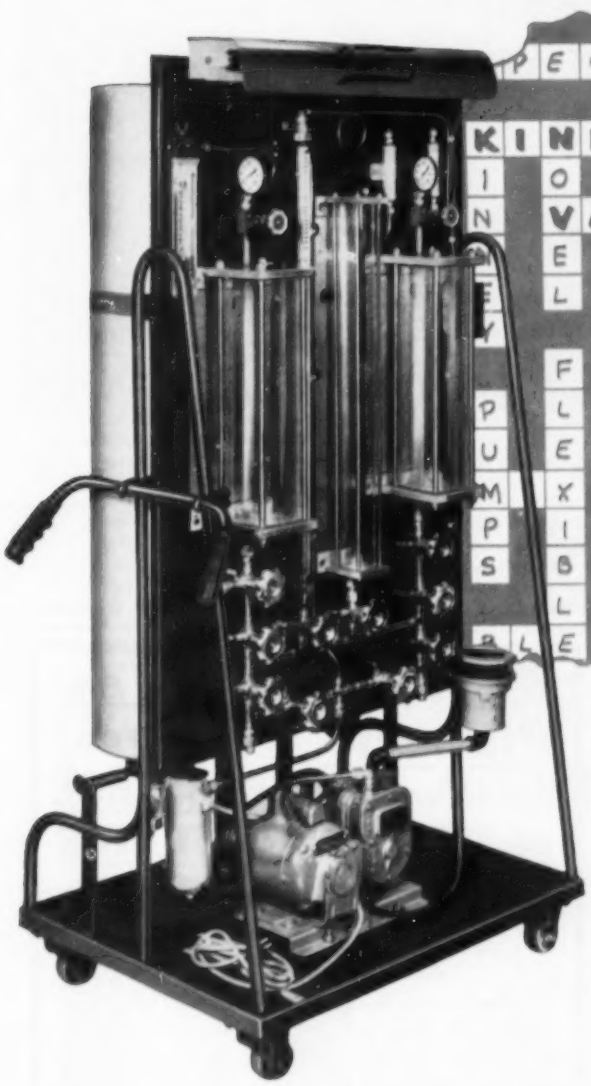
1. Actually destroys moisture . . . . not a mere anti-freeze.
2. Scavenges oxygen . . . . the only product that eliminates this corrosion-causing chemical.
3. Cannot cause pressure drop.
4. Cannot clog with oil.
5. Does not release moisture when temperature changes.
6. May be used in open or hermetic units containing "Freon", methyl chloride, methylene chloride, or isobutane.
7. Costs only about 8 cents per lb. of refrigerant treated. Used in small amounts.

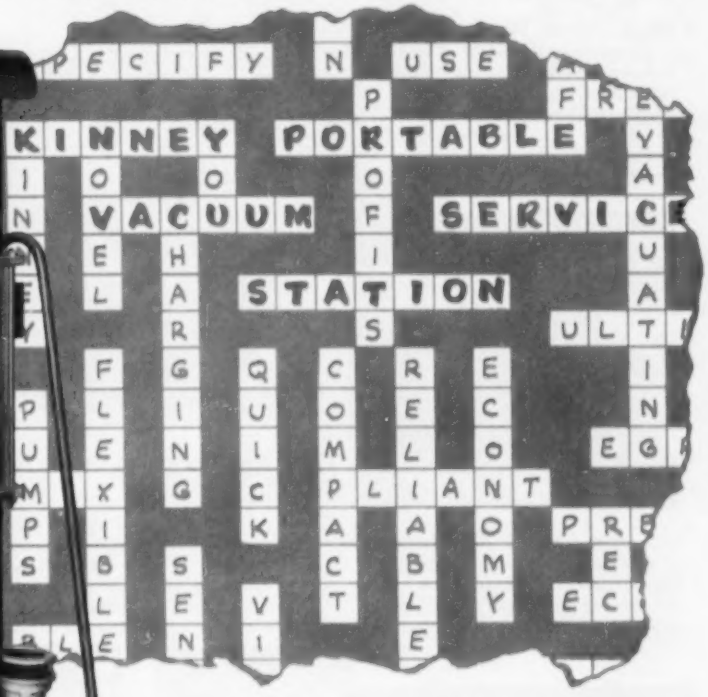
THAWZONE®
The Only Product That DESTROYS Water and Reaches ALL of it

STEWART INDUSTRIES, INC.
(Formerly HIGHSIDE CHEMICALS CO.)
4 Colfax Ave., Clifton, N. J.

Circle No. 44 on Reader Service Card

KINNEY... A SIX LETTER WORD MEANING VACUUM





Puzzled with an evacuating or charging problem? The answer is Kinney. You can get production-line performance from this Kinney Portable Vacuum Service Station . . . duplicating the exacting charging specifications for refrigeration or air conditioning units set by manufacturers. Proper, leak-proof functioning is assured by the integral design of this unit . . . including a Kinney Model KC High Vacuum Pump, Freon cylinder holder, calibrated charging board, and vacuum manifold.

Make your refrigeration service jobs really pay off with a vacuum service station designed to give production-line performance. Send in coupon below for complete data or consult one of our competent vacuum specialists. Kinney, the world's largest manufacturer of vacuum pumps will be glad to serve you.

Send coupon today for further information, or consult the competent vacuum specialists in our district offices — in Boston, New York, Philadelphia, Cleveland, Chicago, and Los Angeles. Inventory and shop facilities are available at Los Angeles.

Please send Brochure covering Kinney Portable Service Station and Accessory items.

KINNEY MFG. DIVISION
THE NEW YORK AIR BRAKE COMPANY
3618 WASHINGTON STREET • BOSTON 30 • MASS.
INTERNATIONAL SALES OFFICE, 90 WEST ST., NEW YORK 6, N.Y.

Name _____

Company _____

Street _____

City _____ State _____

Circle No. 45 on Reader Service Card

28" wide, 72" high, and provides storage space for 1068 10 oz. frozen food packages. All models have four compartments and use Freon-22 as refrigerant.

Circle No. 134 on Reader Service Card

High Speed Hand Drill

Product: Model A-1 "Hanmole" self-sharpening diamond bit masonry hand drill.

Manufacturer: Molco Drilling Machines, Inc., Washington, D.C.

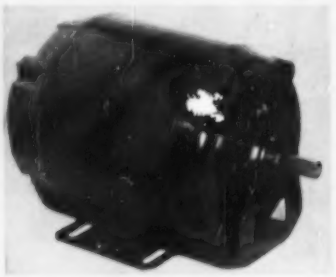
Features: Drill is equipped with special integral water injection system which forces water down center of drill bit to act as a cooling agent. Quick-change adapters allow bit size differences of from ¼" to 2" o.d.

Unit operates on standard 110 volt power, and any standard faucet is adequate for water supply. A lightweight pressure tank capable of supplying water for 30 minutes of drilling is available for outside jobs.

Circle No. 135 on Reader Service Card

Fractional-hp Motor

Product: New 48-frame fractional-hp motor for air conditioning applications.



Manufacturer: Century Electric Co., St. Louis, Mo.

Features: The 48-frame motors have ratings, operating temperatures, torque requirements, and current characteristics, identical to those of the present 56-frame models. All models have pressure-cast aluminum rotor, integrally cast rotor winding and cluster type fan, closed frame, and drip proof bearing brackets. Motors are available in numerous types such as split-phase, permanent-split capacitor, capacitor-start and polyphase. Mechanical variations include open type, totally-enclosed, enclosed "air-over", rigid base, cushion base, flange-mounted, double shaft extension and others. Ratings covered by this frame size are used for room coolers, fans, furnace blowers, unit heaters, pumps and a wide range of other applications.

Circle No. 136 on Reader Service Card

Ice Chip Maker

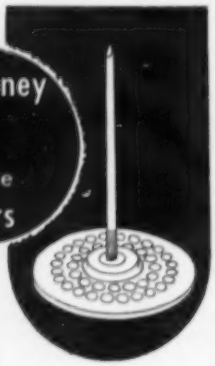
Product: Line of "Zero-Chip" ice making machines.

Manufacturer: Kent Ice Machine Co., Chicago, Ill.

Features: Nine models are available, ranging in size from 2 to 50 tons daily capacity. Unit makes ice in sizes from 1/16" flakes to 3/8" chips. Evaporator has chrome plated interior wall on which ice is formed. Outer wall is made of flange steel and covered with 2" cork insulation and aluminum sheath. All parts are plated to prevent rust. Bottom water trough is separated from cold evaporator to eliminate freeze ups. Unit features no metal to metal contact between walls and ice removing

Save Time—Save Money

with these dependable Insulation Hangers



Here's what you need for fast, easy, low-cost application of insulation to brick, tile, cement or metal . . . *Gemco Metal* Insulation Hangers and Tuff-Bond General Purpose Adhesive for rough surfaces . . . *Tuff-Weld Nylon* Insulation Hangers and Quik-Set Adhesive for smooth surfaces. These hangers and adhesives provide ample strength to hold insulation in place securely. (Use *Gemco Self-Locking* Washers to lock insulation to hangers.) End all expensive drilling or wire-welding with these economical hangers!

GOODLOE E. MOORE, Incorporated, Danville 40, Illinois
or . . . W. D. Elmslie, Ltd., 4837 Lawrence Blvd., Montreal, Canada

Please send complete details and prices on *Gemco* and *Tuff-Weld Insulation Hangers.*

Name_____

Company_____

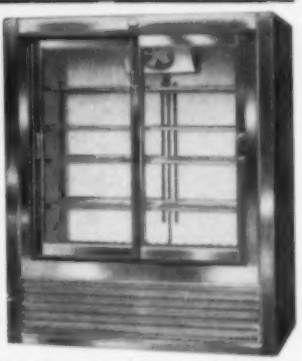
Address_____

City_____ State_____

Circle No. 47 on Reader Service Card

Announcing THE New
Pinnacle 42 CUBIC FOOT
Self-Contained BEVERAGE
AND DAIRY REFRIGERATOR

Here is, without a doubt, America's most outstanding value in a Beverage and Dairy Refrigerator. Quality constructed throughout — not a cheap piece in its whole construction. Its exterior is top quality Stainless Steel and the interior is lifetime porcelain that remains white indefinitely — never turns yellow or peels! Simple to install, too! 5'-0 long, 74" high and 34" deep. 40 sq. ft. shelf area. Approximate capacity — 40 cases of 12-ounce bottles. Has modern fluorescent lighting. You'll be proud to install this beautiful, efficient operating unit; and you'll be more than satisfied with the profit you'll make on every unit you sell!



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A few Pinnacle Territory Franchises are still available. Wire or write today for full information and illustrated literature!

Pinnacle
EQUIPMENT CORPORATION
FLEETWOOD, PENNSYLVANIA
EXPORT DEPT.—39 Broadway, New York

Circle No. 46 on Reader Service Card

Protects foods in storage . . .

Gives long service . . .

Guards against heat flow . . .

No wonder ROCK CORK is the No. 1 insulation for cold rooms, equipment and piping!

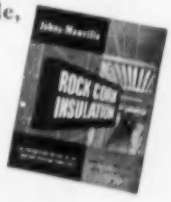
Not just another insulation, *but a many ways better insulation*, Rock Cork has long been the first choice of leading refrigeration engineers.

Rock Cork brings you the excellent insulating qualities of mineral wool, plus the added protection of a moisture-resistant asphaltic binder. Because Rock Cork is basically mineral in composition, it is immune to vermin and mold-growths . . . an extremely important advantage wherever odor-sensitive foods are stored.

Rock Cork is produced in sheet, lagging and pipe insulation forms in standard sizes and thicknesses. Rock Cork Pipe Insulation has the additional protection of an asphalt-saturated asbestos felt jacketing which also speeds installation by reducing the need for seam filling.

Skilled applicators protect your investment! For maximum efficiency, insulation must be installed correctly. Be sure that you get the most out of your insulation dollar by calling in a Johns-Manville insulation contractor. For the name of the one nearest you, write Johns-Manville, Box 60, New York 16, N. Y.

Important insulation facts FREE
Folder IN-122A contains property tables and other important reference data on Rock Cork's advantages. Send for it today!



Johns-Manville ROCK CORK®

REFRIGERATION INSULATION

Circle No. 48 on Reader Service Card

device. Internal fins insure uniform ice freezing on internal walls. Machines are available with or without compressor and for operation with either Freon or ammonia. The 20-ton unit measures 46" in diameter and 6' high.

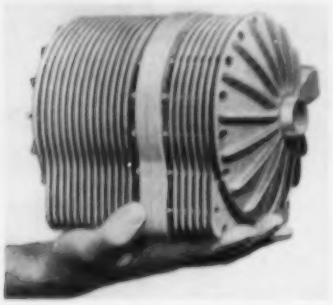
Circle No. 137 on Reader Service Card

Lightweight Compressor

Product: Compact, lightweight "Harv-O-Metic" hermetic compressor.

Manufacturer: Harv-O-Metic Co., Los Angeles, Calif.

Features: Cast aluminum housing of the 1/8, 1/6, and 1/4 hp models measures 8¾" x 6⅝" and the ¼ hp motor-compressor assembly weighs less than 23 lbs. "Deep-fin" design of compressor shell furnishes an extra large heat-dissipating

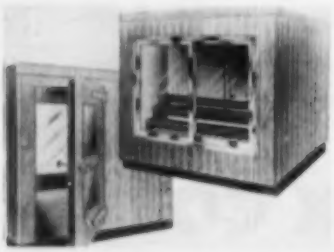


surface while internal circulation of the refrigerant vapor assures low internal operating temperature. Units are equipped with constant-pressure oiling system, oversize bearing surfaces, precision micro-finished internal parts, and may be operated in either horizontal or vertical position. New roller-type compressor design provides high volumetric efficiency and resilient suspension mounts make for quiet operation. Compact features of compressor are utilized in a complete line of small size condensing units also offered by the company.

Circle No. 138 on Reader Service Card

Floral Refrigerators

Product: "Economy" line of floral display and storage refrigerators.



Manufacturer: Character Refrigerators Co., New York, N. Y.

Features: Wide range of models equipped with either sliding doors display front or solid glass picture frame front. Glass in both types is framed with stainless steel. Units also available without display front for use as a walk-in cooler. Exterior finish is of either knotty pine, redwood, or fir. All models are complete with full size walk-in door located in rear or side wall of refrigerator. Units have stepped-up floor display stands as well as glass display shelves on adjustable knife brackets on end walls.

Circle No. 139 on Reader Service Card

Refrigerator Doors

Product: Two new lines of "Display-All" refrigerator doors and sliding panels.

Manufacturer: American Glass Refrigerator Door Co., Los Angeles, Calif.

Features: Refrigerator doors are constructed of double panes of glass surrounded by aluminum framing and are complete with their own mullions. Doors give full vision and accessibility for foodstuffs or beverages in typical reach-in or walk-in refrigerators. Companion line of sliding panels are available in clear or one-way mirror finish and are especially adaptable to meat cutting room installations at self-service meat counters.

Circle No. 140 on Reader Service Card

Temperature Indicator

Product: Model T-10 "Signa-Glow" thermistor temperature measuring bridge.

Manufacturer: Industrial Development Laboratories, Inc., Jersey City, N. J.

Features: Instrument covers range from –70 F to 140 F. Has

easy-to-read, 2-color scale over 5" long and calibrated in both fahrenheit and centigrade. Unit is designed with a single indicator dial and thermistor type sensing probe. It uses no batteries, can be connected to a 115 volt, 60 cycle outlet, and incorporates patented null indicator, which consists of a pair of miniature glow lamps which show both the degree and direction of unbalance. The self-contained unit is housed in a phenolic case.

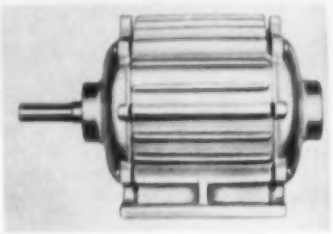
Circle No. 141 on Reader Service Card

Fan-Duty Motors

Product: New line of type EFD totally enclosed ¾ to 20 hp motors for industrial and commercial use.

Manufacturer: Lima Electric Motor Co., Lima, Ohio.

Features: Models are provided with double-width prelubricated sealed ball bearings. Deep, integrally cast fins provide greater heat dissipating surface and allow a smaller transverse section. Windings have extra-heavy polyvinyl-acetal in-



sulated wire for high dielectric and mechanical strength. Type EXFD motors, of explosion proof construction, are also available for use in hazardous locations of volatile gases and explosive dusts.

Circle No. 142 on Reader Service Card

Jointed Wrench

Product: "Handi-Flex" pipe wrench with handle that can be set at different angles.

Manufacturer: Tedd Products Co., Rockford, Ill.

Features: Handle adjustment permits tool to be used in places otherwise inaccessible. Single

square pin controls adjustments, permits different heads to be used; also allows insertion of auxiliary ratchet. Serves dual purpose of acting as a ½" ratchet wrench.

Circle No. 143 on Reader Service Card

there's an of a BIG DIFFERENCE

in the NEW

KRAMER **THERMOBANK**

Here are the major improvements

A NEW HEAT SOURCE - Instead of using only the sensible heat of the THERMOBANK, the new "L" THERMOBANK now utilizes both its sensible heat plus its latent heat of fusion by actually freezing a tube of ice around its reevaporator coil during the defrost. (The "L" stands for latent). This, coupled with significant improvements in the design of the reevaporator coil, gives the "L" THERMOBANK four to five times more heat storage for instant defrost and complete reevaporation.

NO LIQUID REFRIGERANT TO COMPRESSOR - With the vastly larger amount of heat now available in the "L" THERMOBANK, no liquid can return to the compressor during defrost. This is a singular and distinctive feature of the "L" system vastly different from any other automatic hot gas defrost system now available.

CONSTANT CRANKCASE PRESSURE - The "L" system maintains a predetermined low crankcase pressure, thus permitting the use of standard low temperature compressors without danger of motor overloading during the defrost, or oil foaming upon resumption of the refrigeration cycle. The low temperature compressors are less costly since they deliver more Btu's per horsepower.

NO EXTRA SUPERHEAT DUE TO REEVAPORATOR - On larger systems the suction line by-passes around the THERMOBANK during normal operation, thus eliminating any superheat pick-up from the bank by the suction gases during normal operation. This is very important with F-22.

"LOW-LOW" TEMPERATURES - Extremely low temperatures are now achieved with the "L" THERMOBANK and a complete line of "Low-Low" systems are now available.

NO WINTER PROBLEMS - The "L" THERMOBANK can be housed in an unheated space, thus making possible the use of the "L" THERMOBANK in any location, even the arctic circle.

KRAMER TRENTON CO. • Trenton 5, N.J.

Circle No. 49 on Reader Service Card

TIME CONTROLS . . .

Continued from page 51

This type of control is ideal for weekly schedules, if desired. Types such as this are used on air conditioners operating in office buildings which have a regular schedule.

Daily schedules can be obtained without reference to any particular day. In other words, the cycle is based on a weekly schedule with unequal ON periods and unequal OFF periods. Similar controls with 24-hour dials have also been manufactured, with a cord and plug to be used as portable units in controlling window air conditioners.

Dual Dial Helps

Figure 9 illustrates a new type of control which employs the dual dial construction. The inner dial revolves once every 24 hours and the outer dial revolves once every seven days. With this type of a unit which also comes in a portable cord and plug construction, the cycle can be adjusted to get different OFF periods every day of the week and also to skip one or more days every week. This type of control has been designed for window air conditioners for the most part.

A time control does not require any maintenance other than proper installation. The principal enemies of a time control are dust and foreign matter. Most time controls are built with some "slop" in the gear train so that if dirt gets into the gear train it will be ground out rather than trying to bind the gear train. Time controls are not made as accurately as a watch, for this particular reason.

Keep Cover Closed

Synchronous motors are used almost 100% and, therefore, are accurate in direct ratio to the accuracy of the frequency of the current which is applied. There is no oiling or greasing required. A time control should be installed in the case and the door or cover kept closed. The temperature operating range of these time controls varies from 25 F to a maximum of 120 F.

Because the time control operates 100% of the time, and like any other machine is subject to wear, the life of a control is determined by its components. Selection of a time control for refrigeration application must be made with extreme care. A refrigeration time control must be rugged, because of the contingent liability regarding food spoilage.

If a commercial refrigeration user has a time switch turning off the lights and turning them on at intervals, he does not require the same type of time switch that is necessary to conrol his refrigeration defrosting equipment. If the time control controlling his lights does not work, there is no loss entailed. However, if a time control does not bring a refrigeration system out of a defrost cycle, it may be that where the customer formerly had ice cream he now has soup, and where he formerly had steaks he now has spoiled beef. It is this particular difference in the effect that separates a refrigeration time control from all other types of time controls.

Ruggedness Is Important

It cannot be emphasized too much that only the best and most rugged time controls can be used for these refrigeration applications. There are many types of synchronous motors used in the field today. The most powerful of these motors in the synchronous field has a minimum life expectancy of 5 to 7½ years of constant uninterrupted operation. Perhaps in years to come a more rugged type of synchronous motor will be developed, but up until now we only have these figures to show.

The time control is probably the simplest part of a refrigeration system and, no matter how complex the time control looks, it performs only two functions. It opens a circuit or closes a circuit.

All the time controls of the various types used in commercial refrigeration today are offshoots of the four models illustrated with this article. Proper knowledge of the controls and proper installation procedures are necessary in order to obtain the maximum efficiency of any of the various defrosting controls.

FREEZING FISH STICKS . . .

Continued from page 48

through the cooking fat. A second breading line produces fish sticks which are not precooked.

The precooked sticks are loaded automatically on trays which are manually placed on portable racks and pushed into a refrigerated cooler room to bring the temperature down to about 70 to 75 F prior to packaging. A product-to-air temperature differential of about 15 degrees F, which prevents excessive drying of the sticks, is maintained in the 11 x 13′ cooler by means of a vertical York air handling unit. This unit, rated at approximately 5400 cfm, is located in the room itself.

Automatic Freezing

Cartons are hand filled, wrapped automatically at the rate of 60 per minute, and conveyed on a belt to the package freezer, where a pusher mechanism shoves them between the freezer plates. Frozen cartons are simultaneously pushed out of the freezer onto a discharge conveyor, packed in master cartons, and placed in a –5 F storage room.

Plates of the package freezer, chilled to –40 F by direct expansion, accelerate the freezing process by moving together to form compression with the tops and bottoms of the cartons. Each freezer plate holds six rows of 10-ounce cartons, 14 to the row, or a total of 1680 cartons in a 20-plate freezer.

Two-Stage System

Refrigeration for this package freezer is provided by a two-stage system utilizing a 25-hp, 8-cylinder booster compressor and a 30-hp, 4-cylinder second stage compressor, each with 3¼″ bore and 3″ stroke. These units are coupled with a 14″ x 16′ condenser and a 20″ x 8′ intercooler.

Production capacities of all units in the production line are equalized, resulting in a uniform flow of product from beginning to end, hour after hour.

BUY FROM YOUR REFRIGERATION WHOLESALER

BOOST BUSINESS . . .

Continued from page 46

the whole idea has become quite a conversation piece among our customers. As a side effect, this stunt also has boosted our floor traffic considerably."

Mechanics of the Messner house organ are kept as simple as possible. It is printed locally by a commercial printer. Paper stock is bought through this printer once a year and is cut into sheets twice the size of a standard letterhead.

Printed by letterpress at the time the paper is purchased is the front page "masthead" carrying the

name of the house organ, name and address of the Messner firm, and a halftone engraving of the company's place of business. Also printed at this time is the back page signature with postage permit notice and space for addressograph imprint. This part of the job is printed in two colors, so it is more economical to have the entire year's supply (about 30,000 copies) printed at once than to have it done each month just to save a hundred or so sheets of paper.

From this point on, the monthly editions are run off by the offset process. A girl in the Messner office types out the copy in the width desired on a glossy paper, and pastes these pieces of copy on a separate dummy sheet for each page. Pictures to be included also are pasted on these same dummy sheets in the arrangement desired. The dummy pages are then sent to the printer. Here they are photographed and offset printing plates are prepared which are then used to imprint the blank stock for that month's issue.

"Total expense for the house organ runs about $100 per month," Messner explains, "not counting the cost of our own office help, which is considerable. This load is eased, however, by having them do the work in off-peak hours."

The value of such a publication as "Facts 'N' Figgers", Messner feels, speaks for itself. He recognizes, however, that there are potential pitfalls in the preparation of such a house organ which might well trap the unwary and the inexperienced, so to any other dealer planning such a publication, Messner offers these few words of warning:

"Make it the direct responsibility of a smart employee, and then give that employee time to work on it. It takes more time and effort than meets the eye. Equally important, spend some time acquainting your salesmen with the tremendous advertising value of the publication. And finally, *don't* prostitute its homey news value by including direct equipment advertising."

Circle No. 51 on Reader Service Card

Why Guess?
...when you can be sure with
LIQUID EYE®

The industry-accepted indicator for all refrigeration purposes.

LIQUID EYE "100"
In ¼" and ⅜" flare and O.D.S. sizes in the 100 Series.

LIQUID EYE "200"
In ½" and ⅝" flare and O.D.S. sizes in the 200 Series.

LIQUID EYE MEANS: perfect refrigerant visibility • strata-thru flow • leak-proof—high safety factor • spring loaded gaskets • standard wrench flats • instant analysis of refrigerant condition.

Sold by leading Wholesalers. Send for Catalog D-56, covering the complete Allin Line.

Allin MANUFACTURING COMPANY
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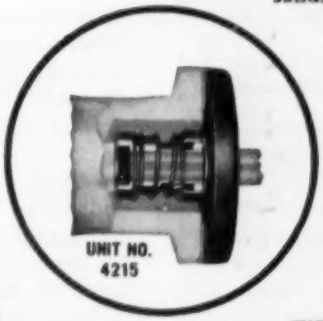
ROTARY SEAL *Replacement Units*

The original replacement units—performance-proved in many thousands of installations during almost a quarter century.

EASY TO INSTALL
ECONOMICAL
EFFICIENT IN OPERATION



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"Seal with Certainty!"

THE mechanical seals for ROTARY SEAL COMPANY rotating shafts

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Stocks Handy Everywhere!...

genetron®

Super-Dry Refrigerants

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genetron 12 WHITE LABEL
DICHLORODIFLUOROMETHANE

genetron 141 GREEN LABEL
MONOCHLORODIFLUOROMETHANE

genetron 226 PURPLE LABEL
TRICHLOROTRIFLUOROETHANE

Free! Valuable New Folders!
Ask your wholesaler for new folder on "*Genetron*" Super-Dry Refrigerants. Contains pressure-temperature charts and other helpful information.

No Matter Where You Are

There's a* genetron *Wholesaler Near You!

Coast-to-coast, America's leading Refrigeration and Air Conditioning Wholesalers feature "*Genetron*" *Super-Dry Refrigerants.* There's one as near to you as your telephone ready to supply you with complete stocks of "*Genetrons*" and with up-to-the-minute data on their uses.

Remember—"*Genetron*" *Refrigerants* are super-dry! Their moisture content is exceptionally low; their over-all purity, extremely high. They meet the industry's most exacting refrigerant specifications . . . are freely interchangeable with comparable fluorinated hydrocarbon refrigerants produced by any other manufacturer. Follow the industry-wide trend to Super-Dry "*Genetrons.*" Insist on "*Genetrons*" when buying refrigerants.

"GENETRON" DEPARTMENT
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
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Offices in principal cities

GC
Allied Chemical

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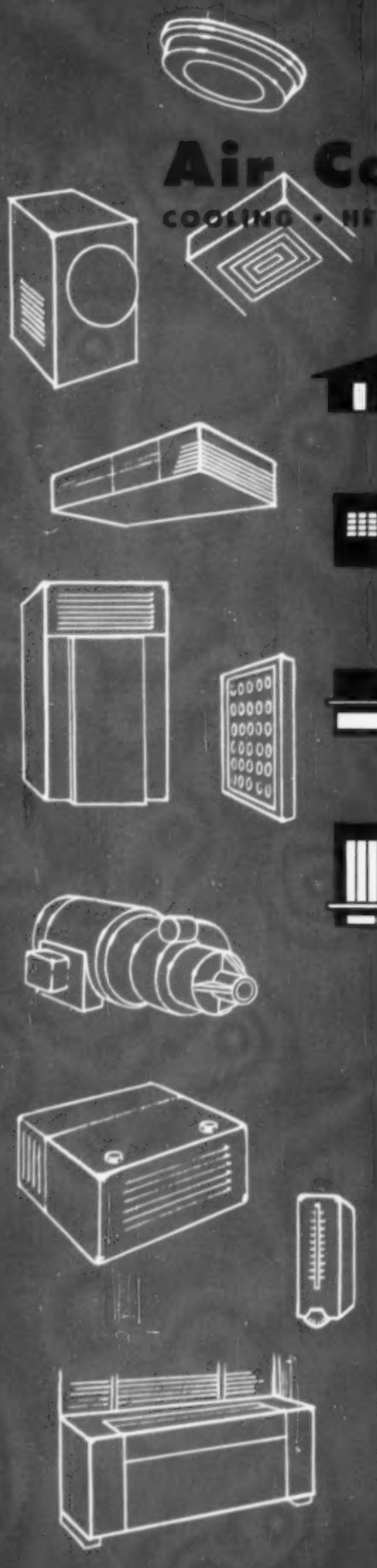
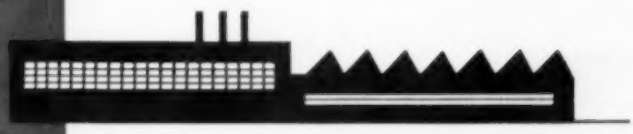


Air Conditioning Section

COOLING • HEATING • CIRCULATION AND HUMIDITY CONTROL

RESIDENTIAL



INDUSTRIAL

COMMERCIAL

INSTITUTIONAL

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Editor's Note:

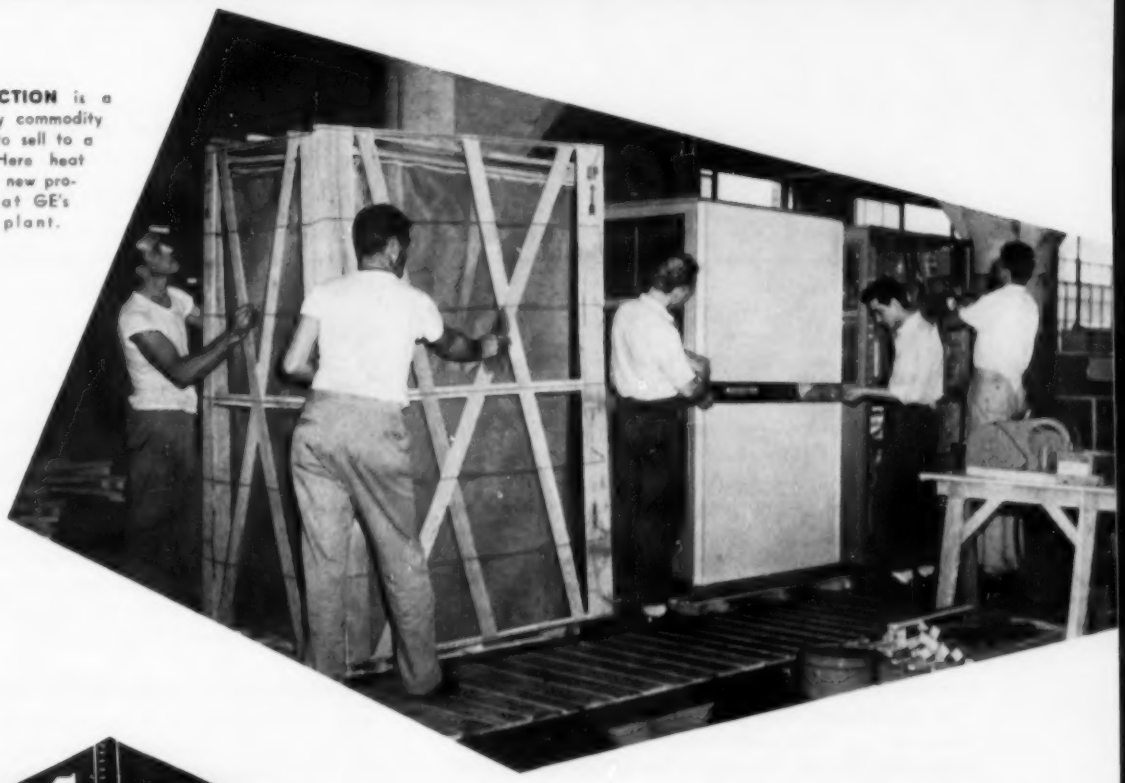
THE HEAT PUMP has been known and talked about for many years, but it still is in the "never, never land" as far as many dealers, distributors and contractors are concerned. They fail to realize that this product gradually but steadily has evolved from its developmental stages and now stands literally on the threshold of mass production and mass application.

In the years immediately ahead, the heat pump inevitably will become a major factor in the year-round air conditioning of residences as well as all manner of commercial and industrial establishments.

On the pages that follow, the editors have attempted to present a comprehensive analysis of the merchandising potentials of this new and vital product, and to offer some insight as to the impact the heat pump may have on the business of all those individuals and firms engaged in the air conditioning field.

Much of what is presented here is admittedly opinion, but it is considered opinion which has been based upon extensive conversation and correspondence with some of the most informed and reliable authorities in the heat pump field.

Special credit for the development and preparation of this material goes to Richard R. Tryon, the associate editor of COMMERCIAL REFRIGERATION & AIR CONDITIONING.



MASS PRODUCTION is a must before any commodity can be priced to sell to a mass market. Here heat pumps roll off a new production line at GE's "Weathertron" plant.

THE HEAT PUMP

. . . the Boom is starting NOW

Newest Evidence Indicates that Current Year Will Mark Opening Stage of Amazing Sales Volume Increase

FOR more than 20 years, people have been discussing the *future* potentialities of heat pumps; how these amazing devices might ultimately revolutionize the heating and cooling of millions of homes and commercial buildings. Today, among most air conditioning contractors and dealers, there is still the same talk about a coming boom in heat pumps — as though it should be expected perhaps five or ten years hence.

In contrast to such anticipation of future expansion, there is ample evidence today that *the opening stage of that boom has already arrived.*

The same facts also indicate that further growth of the heat pump boom will be much more rapid than has been anticipated except by a few enthusiasts, and that its ultimate magnitude will be far greater than most dealers and contractors have foreseen.

The newest evidence — gathered by the editors of *Commercial Refrigeration & Air Conditioning* — indicates that sales of heat pumps will exceed $25,000,000 in 1956, including costs of installation.

About 80% of the total dollar volume in 1956, it is indicated, will be represented by approximately 10,000 packaged residential units. The remainder will be in commercial installations, of both packaged and custom-built types.

Equally impressive is additional evidence that residential heat pump sales will increase to about 190,000 units annually, between 1956 and 1965, and that they

"In recent years, heat pumps. . . have been field tested in large numbers, and vastly improved in design and performance. They are ready now for intensive selling."

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will continue in the neighborhood of 200,000 annually thereafter. With a parallel increase in commercial installations, the combined average dollar volume between 1956 and 1965 should be approximately $150,000,000 annually. It should be around $340,000,000 annually by the end of this period — almost a million dollars a day.

Heat pumps, which apply the basic principles of mechanical refrigeration to heat buildings in winter with the same mechanism used for cooling in summer, have been going through a period of experimental development for more than 20 years. Their theoretical possibilities were known even many years before that.

In recent years, they have been field tested in large numbers, have been vastly improved in design and performance, and have produced results so satisfactory to the users that they can no longer be considered as being only in an experimental stage. They are, instead, ready right now for intensive selling. (See also: "The Heat Pump — Where Most of Them Will Be Sold.")

Public Must Be Told Economy Story

Even a considerable sector of the public is already aware that heat pumps have gone beyond the stage of "laboratory magic" and are now in the realm of practical application. What the general public does not yet know is that these devices now may be installed and operated with far greater economy than was previously possible. That information remains to be told by dealers and contractors, and by the manufacturers, as part of an expansion of the normal selling process.

There are several ways to measure the evidence that a tremendous expansion of heat pump usage is today under way. One of these is by taking stock of the enlarged facilities being readied for their maunfacture.

Of course, *any* manufacturer of conventional air conditioning systems can rather easily alter the design of its cooling mechanisms so that they will pump heat from outdoors into a structure for winter heating as well as pump heat from indoors to the outdoors for summer operation. In some cases, little more is required than the installation of a four-way valve and suitable controls to reverse the flow of refrigerant, and the addition of a means of defrosting the coil which serves in summer as a condenser and which functions in winter as an evaporator.

Awareness of the relative ease with which any air conditioning manufacturer can open up a heat pump department probably accounts for what seems to be no more than a postponement by some of them of a decision to do so. In such cases, a flurry of conversion may be anticipated later.

On the other hand, there probably will be some manufacturers of year-'round air conditioning units which burn oil, gas, or coal for winter heating who will refrain from entering the heat pump field because they consider their present units more practical for winter heating in the largest area of the American market.

In contrast, however, several major manufacturers of air conditioning or its components are already in production in the heat pump field, and several others who have everything ready for production to begin as soon as the go-ahead signal is given.

Production Expansion Is Significant

Especially significant is the expansion of facilities for production of heat pumps or of their special components which have been recently accomplished, are in progress, or are contemplated by several concerns.

General Electric Co., presently the largest producer of heat pumps, has recently added a new assembly line in its "Weathertron" plant at Bloomfield, N.J., and is in position for further expansion as rapidly as the volume of sales may require.

Significant also is the recent completion by Westinghouse Electric Corp. of a new factory at Staunton, Va. This plant, with 300,000 sq. ft. of floor space, is now used for producing conventional conditioners as well as heat pumps. Nevertheless it represents a capacity expanded with the increasing sale of heat pumps especially in mind.

Typhoon Prop-R-Temp Corp. of Florida, which has recently announced plans to merge with Hupp Corp., will gain expanded production facilities by this move. The company claims to have produced about 40% of all the heat pumps now in use in this country.

Acme Industries, Inc., of Jackson, Mich., has expanded its production of both packaged water-to-water units and equipment for custom-built heat pump installations, and has both commercial and residential units in use from Florida as far north as Wisconsin and Minnesota.

American Coils Co., Newark, N.J., has expanded both its production and merchandising activities in the heat pump field, and has been working closely with interested power companies to promote good application and installation practices.

Carrier Corp., Syracuse, N.Y., while not as yet producing packaged heat pumps commercially, does have units in the development and testing stage. The company has anounced that it will introduce an air-to-air unit for homes this fall.

Remington Corp., Auburn, N.Y., has been supplying residential type units with heat pumps for the South

and Florida markets and plans to continue to do so without increasing present facilities.

The Trane Co., La Crosse, Wis., has for five years been manufacturing all components for heat pumps; the company does not make a packaged unit. However, increased production facilities for heat pump components has been made available in a 55,000 sq. ft. quadrant now being added to one of its La Crosse manufacturing plants.

W. W. McMillan & Co., Jaksonville, Fla., is one of the newer manufacturers in the field, having only recently announced that it will make a line of packaged units for home and commercial use. Standard units will range from 2 to 15 hp capacity and custom-built equipment up to 100 tons.

Heat-X, Inc., introduced models of heat pump equipment at the recent ARI Exposition in Atlantic City. Several other manufacturers, among them York Corp. and United States Air Conditioning Corp., have been making window and room air conditioners using the heat pump principle, but have not as yet extended their activities to include larger size units.

In addition, it is known that several other manufacturers have heat pumps designed and presently kept "under wraps." Also, several makers of controls and valves have expansion plans ready for production of specialized models for heat pump use.

Another key factor indicative that the time is ripe for transition of heat pumps from the stage of spasmodic selling to a stage of boom-type growth is found in the already-achieved vast improvements in basic heat pump design.

The first heat pump in America to be installed outside a research laboratory went into service 22 years ago. Gradually more and more of these devices came into use in subsequent years, in commercial and residential installations. But the gain was slow for many years while manufacturers and engineers experimented and tested, seeking improvements in design, performance,

Continued on page 88

Where Are Heat Pumps Being Installed Today?

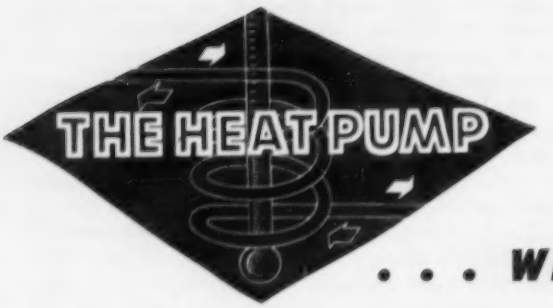
. . . here are some actual photos of typical applications

. . . SCHOOLS AND INSTITUTIONS

. . . COMMERCIAL ESTABLISHMENTS

. . . EXISTING RESIDENCES

. . . NEW HOME PROJECTS



. . . where it will be sold

Sectional Analysis Shows Potential Market Far Greater Than Conservative Predictions of Actual Sales Totals

FOR dealers, contractors, jobbers, and manufacturers in the general field of air conditioning, it can be a matter of major financial importance to have advance estimates of *where* the most favorable future markets for heat pumps will be. Also, it is by computing expectable sales regionally that the over-all totals for the nation may best be obtained.

The determining of expectable sales by regions involves several factors. These include differentials in operating costs, especially in winter, as influenced by the performance of heat pumps at various temperature levels which, in turn, are primarily a product of climate.

Other major factors include original purchase cost, the availability of terms for easy financing, differences in area levels of prosperity, and regional differences in the desire for summer cooling. The final yardstick for computing the future market consists of the predictable regional figures for the volume of new residential and commercial construction.

Even the factor of sales effort can be forecast as "adequate" by merely foreseeing that American business men are much too astute to fail to match the heat pump opportunity with a sales effort of appropriate intensity and size.

Conservative analysis of the major factors on a sectional basis provides a national total which fits closely the private estimates of several manufacturers of heat pumps and other recognized authorities in this field. It anticipates a national total of 10,000 residential installations in 1956, more than double the total for 1955, and further indicates that:

1. By 1965, the residential part of the heat pump boom will reach a national level of approximately 193,000 units annually, almost 20 times the volume of 1956.

2. The potential market—after allowances for realistic limitations—will be more than twice as large as the predictions of actual sales.

3. The rate of sales, compared to population, will be greatest in 17 states of the South and Pacific Coast sections. In this area, with about 36% of the nation's population, sales should be approximately 46.5% of the national total.

4. In 11 states and sub-states primarily of the North-South "border" region, with 16% of the nation's population, sales will be approximately 16.5% of the national total.

5. Annual sales in the North, with 48% of the total population, will be approximately 37% of the volume for the nation as a whole.

6. Commercial installations of heat pumps will increase in all areas at a rate paralleling the gains in residential units—at about 6% of the annual residential total in terms of horsepower.

Before translating those figures into their further significance, it will be desirable to consider the correlated factors on which they are predicated.

The dominant factor in the sales distribution of heat pumps will be climate. This is primarily because the operating efficiency of these devices—when used for heating—decreases with a lowering of the temperature of their outdoor sources of heat. (See also: "The Heat Pump—How It Gets Its Winter Efficiency.")

In the relatively mild winters of the 17 states of the South and Pacific Coast areas, heat pumps will

GEOGRAPHY IS A FACTOR in heat pump sales, as clearly indicated by this map. Numerals following state designations show number of heat pumps installed to Jan. 1, 1955, as tabulated by Edison Electric Institute. Figures for Arkansas and Idaho are reported but unverified. No data available for states where no figure is shown. National total thus shown was 3143 installations. This number, however, is admittedly incomplete. The Institute estimates that the actual number should approximate 4300, and that installations in 1955 should add 4500 more to this total. Percentage estimates of future volume by geographic areas is indicated by the shading on the map.

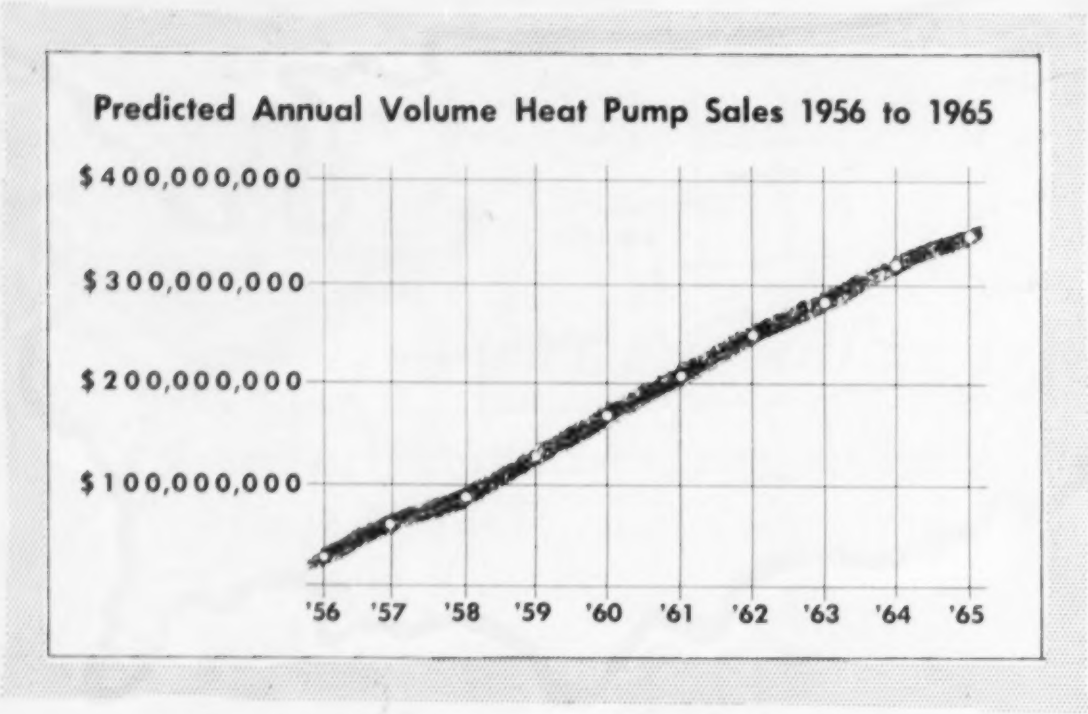
usually operate at levels having a higher coefficient of performance in heating than in any other major area of the nation. Included in this region are: Maryland, Delaware, Virginia, North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Texas, Arizona, California, Washington, and Oregon.

In this area, a heat pump will operate usually, or entirely, at temperature levels too high to require the use of resistance coils as supplementary sources of heat. This means that instead of obtaining considerable quantities of supplementary heat on a basis of 3412 Btu for each 1 kwh of current consumed, they will almost invariably be so located that they will obtain a "bonus" of heat which will allow them to yield around 10,000 Btu for each 1 kwh of current consumed.

At the same time, because outdoor temperatures are higher, the total quantity of heat required in the average hour will be less than in other areas of the nation, and the number of hours in the heating season will also be much fewer. Thus, in this area it is possible to heat a well-insulated house of 1000 sq. ft. with a heat pump for as little as $40 to $60 a season—even less in some exceptionally favorable locations.

Because of the high bonus of heat which a heat pump obtains from outdoor air or underground water in this area, without added cost of electricity, the operating cost of such a unit will usually or frequently run less than the alternative cost of heating by the combustion of gas, oil, or coal. Assuming that other factors of desirability are not out of line, this means that low operating cost alone will be enough to assure a high popularity of heat pumps throughout this large area.

Add to the factor of low heating cost the added appeal of freedom from fuel delivery and storage problems, and even from the need of chimneys, and it becomes apparent that even if a heat pump had to be considered as a heating unit only—without doubling as a summer cooler—its desirability in this area



THE FUTURE LOOKS BIG in the heat pump field. The steadily rising curve on this graph indicates anticipated growth of the market, according to most informed estimates, but is not intended as an index of specific dollar volume.

will be difficult to challenge except in the field of minimum housing.

But there are still other reasons that will contribute to giving these 17 states the highest rating in predictable future sales. One of these is the fact that generally this area has a considerably greater need and desire than other areas for summer cooling—which a heat pump will supply without requiring a separate cooling mechanism. Thus, climate applies greater pressure here for *some* kind of year-round air conditioning than in any other section.

As for the original cost of a heat pump, including installation, it now compares favorably with other forms of year-round systems, and it is predicted that in the near future it will be priced perhaps $200 less.

Moreover, with the easy terms of financing available today, especially in the construction of new houses, the original cost of a heat pump will certainly not be a stumbling block to its future acceptance except in relatively low-income brackets. When included in the purchase price of an average-size house, its original cost will normally amount to barely $5 to $8 a month more than a furnace system only. Thus, the first cost of a heat pump will be an amount that almost any income-earning family can afford.

In this 17-state area there is a population of approximately 36% of the nation's total. Correspondingly, there may be expected an annual construction of about 360,000 new homes, out of a national total of about 1,000,000.

In theory, based on easy purchase terms and low operating costs, it would be *practical* for probably 9 out of 10 owners of new homes in this area to include some form of year-round conditioning as part of the original equipment. But sheer realism must assume that surely 4 out of 12 new home owners in this area will reject every form of cooling-and-heating, and content themselves with heating only.

Of the remaining 8 in every 12, extreme conservatism suggests that 3 will make heat pumps their choice—leaving 5 to choose central systems combining separate heating and cooling units, or window or room-type air conditioners in combination with some other form of heating.

When 8 out of 12 new home owners desire to *buy* some form of year-round air conditioning, when there are thousands of dealers and contractors who desire just as greatly to *sell* heat pumps, and when there are so many factors to recommend heat pumps, sheer realism cannot accept any lower future estimate for this area than 3 heat pumps in every 12 new homes.

No one expects that ratio to be attained this year, even though the basis factors are almost as applicable now as they will be later. Rather, it is a prediction for 1965—the year that other considerations point to as the date for its attainment. But even the present

year will show a tremendous gain, as an analysis of those other considerations will presently show.

In the ratio indicated for 1965, the construction of 360,000 new houses in this area would mean the sale of 90,000 residential heat pumps. This, as subsequent figures will show, would be 46.5% of the national total.

In addition, it should be remembered that the same basic factors favorable to residential heat pumps are equally applicable to commercial installations. Hence, the *rate* of gain for commercial installations is expected to parallel the residential increase, but not until after the present year.

The explanation for that temporary divergence begins with the fact that sales of commercial heat pumps have been disproportionately high. This was largely because corporation funds were more readily available in the "experimental" years, and because custom-made units as frequently used for commercial installations could be closer to future prices than residential package units which were not yet numerous enough to reflect the advantages of mass production.

In contrast, today the price factor and financing terms for residential units, coupled with the high level of personal prosperity, tend to overcome the previous imbalance. Also, from now on there will be increasing pressure to make it possible for *all* the family to enjoy year-round air conditioning at home.

Hence, although commercial installations have amounted to about 15% of the total in the past, and about 35% of the horsepower, their ratio to residential from now on will be somewhat smaller. Their actual totals would gain year-to-year at the same rate as residential, however, while the ratio remains constant.

Estimating Home-Commercial Ratio

We can make a rough but reasonable estimate of that future ratio by first estimating there are 40 million persons who work in indoor jobs. Then, if each of these required ¼ hp for heating and cooling, the total would be 10,000,000 hp. In turn, taking into consideration offices, shops, and stores of small size, if the average year-round commercial installation were 5 hp, the total of them would be 2,000,000.

Those 2,000,000 commercial *places* would compare with 50,000,000 homes. So, assuming that pressure and action are equal—after 1956—for heat pumps for commercial and residential usage, the number of commercial installations would be 1 in every 26, or approximately 4% of the total. But with about 3 hp in the average residence, the commercial group would represent about 6% of the total horsepower.

Accordingly, in the 17 most favored states, the 90,000 annual total of residential units with 270,000 hp, for 1965, would be matched by 3600 commercial installations with 16,200 hp. The combined dollar value (at $1700 per residential unit, and $500 per horsepower in commercial units) would amount to an *annual total of $161,100,000.*

Similar computations for other regions (which follow) indicate 193,000 residential units annually for the nation as a whole by 1965, with 579,000 hp, will be matched by 7720 commercial installations annually, with 38,600 hp. On that basis, the *national annual volume of heat pump sales would be $347,100,000—almost a million dollars a day.*

Basis of 1956 Sales Hopes

In the face of conditions favoring such totals for 1965, it is chiefly a matter of limited production capacity which has determined the estimates of manufacturers and other authorities for the sales volume of heat pumps in 1956. However, there also are three other factors that enter into the current picture: (1) Sales impetus has not yet been built up enough to make full use of the principle that "the more they sell, the easier they sell"; (2) Prices of residential units are still perhaps $200 higher than will prevail as selling increases; (3) The amount of sales effort is still relatively low because as a practical matter it must be geared to the level of quickly attainable results.

On the basis of those considerations, the predicted national total of residential heat pumps for the present year is 10,000 units—more than double the total of the previous year, and quite adequate to signify the further gains that are forecast for the following years.

This national residential total for 1956, with about 30,000 hp, will be presumably matched with about 800 commercial installations having approximately 10,000 hp. Although this reflects a commercial ratio much higher than is expected as the long-term average, it is accounted for by a carry-over of the factors which made the ratio still higher in the past.

In financial terms (allowing $2000 for each residential unit, and $500 per horsepower for commercial installations), the indicated *national volume of heat pump sales for 1956 will be $25,000,000*—approximately as great in this one year as in all the combined years of the past.

For the 17 states of the most favored region (at 46.5% of the national total) the indicated volume for

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"With the financing terms available today, the original cost of a heat pump should not be a stumbling block except in relatively low-income brackets."

. . . HOW IT GETS ITS Winter Efficiency

Heating Costs Are Key to Public Acceptance--So Here's Simplified Explanation of Its Cold Weather Performance

PRESUMABLY everyone in the air conditioning business knows the basic principle of heat pumps—the reversed flow of refrigerant—which permits them to provide heating in winter as well as cooling in summer.

But there are a number of mechanical and environmental factors affecting a unit's performance efficiency which a dealer or contractor must also know intimately if he is to have a realistic evaluation of heat pumps and if he is to discuss them adequately with prospective buyers.

In the latter connection it should be remembered that it is the heating performance, rather than the cooling, for which the prospective customer demands a reassuring explanation. The cooling function is already well understood, or is taken for granted.

To evaluate the heating performance for the dealer or contractor, himself, the best starting point is to take note that the typical unit has *three* different sources for its heat, all of which must be considered in their joint relationship.

The first source of heat is the electricity consumed by the compressor motor and by any other motors which may be so located that this warmth is discharged where it will be useful. Even if this heat does not directly enter the air distribution lines but merely escapes into a basement, for example, it performs a useful function and should be so credited.

Although motors are operated for power rather than for the purpose of heating, the amount of heat given off by a motor and any equipment it operates is directly proportionate to the current consumed, and is the same amount that would be given off if the same current were consumed in a resistance coil designed for heating only.

Thus, the heat given off by the motorized components of a heat pump from this first source will be approximately 3412 Btu for each kwh of current that they use. If, for example, the motors deliver 1 hp continuously for an hour, the consumption will be approximately 1 kwh. But it may be that a motor having 1 hp capacity will be called upon to deliver only 80% of that amount. In such case, the current consumed will also be proportionately less; about 80% of 1 kwh. In turn, the heat will also be proportionate; 80% of 3412 Btu.

If this first source of heat were the only source, the operating cost of a heat pump in extremely cold weather would be very expensive. It would mean, for example, that if outdoor temperatures were such that 34,120 Btu were required per hour to make a house comfortable, the motors would have to be big enough to consume 10 kwh of current. At 1½¢ per kwh, the cost would be 15¢ an hour or $3.60 a day.

It is in their second source of heat that heat pumps gain an advantage which in most American climates is more than great enough to offset the relatively high cost of their first source. This second source may be the outdoor air, underground water, or the subsurface warmth of the earth.

Omitting the technical details of how these devices are able to extract useful heat from sources which

may be at temperatures below zero (in the case of air), it can be said that the principle is the same as what happens when the mechanism of a household refrigerator extracts heat from the cabinet's interior (which also may have areas as cold as zero). Just as the refrigerator mechanism discharges heat obtained from the cold interior of the cabinet into a kitchen, so does the heat pump mechanism discharge heat obtained from the "cold" outdoors into all the rooms of a house or other structure.

In the case of the heat pump, this heat brought indoors in winter is a *bonus*. It is added to the heat derived from the electricity consumed in the motors *without requiring additional current consumption*.

The amount of heat thus brought indoors depends on a number of factors. Size and design of the unit, and the duration of operation, are among these items. But once the size and design have been chosen and the unit has been installed, there still will be variations in the quantity of heat thus obtained, depending on the temperature of the medium from which it is drawn.

When the temperature of the source—air, water, or earth—is high, the heat bonus will be large in its relationship to the quantity of current consumed. Similarly, the amount of the bonus will be relatively low when the temperature of its source is low.

At any specific temperature there also will be variations in the bonus heat quantity in response to differences in the mechanical efficiency of the products of different manufacturers. For example, some aim at low first cost rather than at maximum operating efficiency, while others put a heavier burden on the purchaser in the original cost but give him the benefit of maximum economy in operation.

Thus, it is impossible to give a performance table relating to outdoor temperatures which would be the same for all makes and types. However, it is possible to take realistic hypothetical figures and show the significance of them.

For example, it is not uncommon, when the temperature of outdoor air, water, or earth is 60 F, for a heat pump to bring indoors 6824 Btu in an hour, at the same time that it is also getting 3412 Btu from its motor components by their consumption of 1 kwh of current. In such case, the combined total, 10,236 Btu, is three times as great as the 3412 Btu which were inherent in the electricity itself. Hence, on such basis it would be said that the unit's "coefficient of performance" at 60 F is "3".

Similarly, when the temperature of the outdoor heat source is 15 F, the same heat pump might bring indoors only 3412 Btu an hour, to add to 3412 Btu

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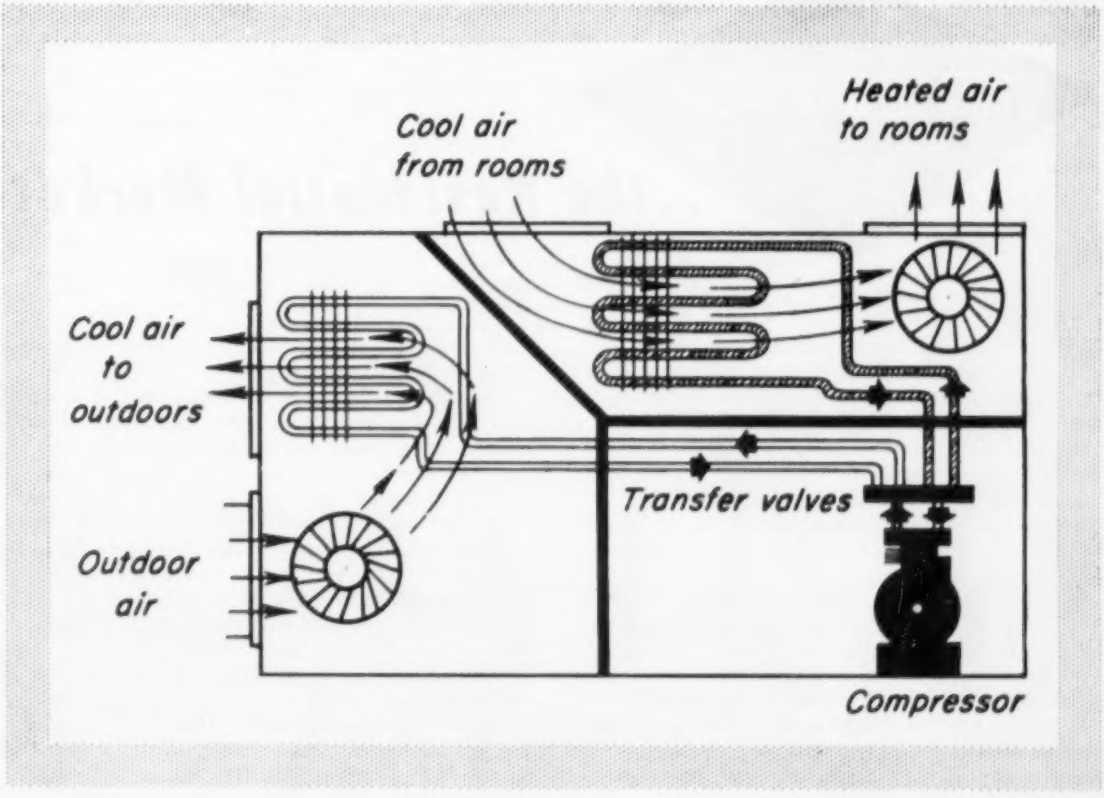
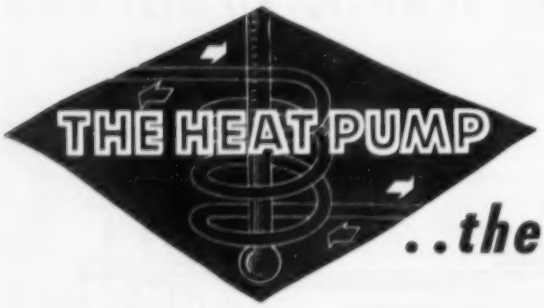
▼ Simplified Heating Cycle of Air-to-Air Heat Pump



COMPLETE YEAR-ROUND COMFORT is provided in this southern Michigan residence by a water-to-water heat pump. Evident in the photo of the home's living room are the wall mounted temperature controllers, outlet grille for the remote room conditioner, and a corner of the radiant ceiling.



..the Residential Market

HEAT pump sales for residential applications are expected to break all previous records in 1956, thereby serving as the spearhead in the now-developing boom in this type of year-round air conditioning.

However, even if sales in the residential classification, as expected, total more than 10,000 units in 1956—more than the combined total of all previous years—the new figure will represent just about 5% of the annual volume predicted when the boom attains its full stature.

The main field of the residential grouping will be in one-family houses, with gradually increasing emphasis on new structures. But there will also be a large volume in other types of living accommodations—in apartments and duplexes, and also in motels and hotels.

All parts of the residential category will find certain general attractions in heat pumps. The first is, of course, that these units can provide year-round air conditioning in the places where people spend the greatest number of their hours.

Secondly are factors of architecture and of personal convenience—the fact that heat pumps eliminate problems of fuel delivery and storage, and do not even require chimneys.

Without storage tanks or chimneys, and because a single mechanism takes care of both cooling and heating, the original cost of heat pumps will often also be a favorable consideration. In addition, their cost of operation will be favorable or at least closely competitive with other forms of year-round air conditioning in most areas, although it may be somewhat unfavorable to heat pumps in regions where winter temperatures are exceedingly cold. (See also: "The Heat Pump—Where Most of Them Will Be Sold.")

Even the northern area problem of providing heat in the relatively short periods when the performance

coefficient of heat pumps is low while the heating requirements are high—now met by the use of auxiliary resistance heating—may ultimately have a still better solution. One possibility would be to equip the usual gas-fired domestic hot water heater with a special heat-discharing coil located in the air duct system. This coil could be thermostatically controlled to operate only in periods of extremely cold weather, and could be valved so that it would easily add 15,000 Btuh to the household, while having a remaining capacity of about 15,000 Btuh still adequate for producing domestic hot water. Only the rate of recovery of the water heater would be affected by such an arrangement—and even that would be a minor matter.

There are also a number of special factors that are applicable to one or the other of the two fields of the residential classification.

In single-family residences, the heat pump practice of moving relatively large volumes of air without increasing velocity, and at moderately warm temperatures, will be popular with some families.

For apartment houses, motels, and hotels, the owners may choose in some cases to install central systems using either a large custom-built heat pump, or a battery of package units. But it is highly likely that another popular application of heat pumps for such structures will ultimately be in-wall units for each separate suite. Such units would be much smaller than the 3-hp size which is presently a common standard for house-size use. Already, some small-size units are available, arranged for window installation but convertible for in-wall applications.

Perhaps the most significant residential heat pump project now in process is at Fullerton, Calif., where a complete community of 431 homes is to have this kind of year-round air conditioning. The first 20 of these have been completed, and six more are scheduled for completion in the current month. Faster progress is planned for later in the year.

A Guide to Operating Costs

(1000-sq. ft. home — Cleveland, Ohio)

MONTH	HEAT-KWH	COST	COOL-KWH	COST
4/54	389	$ 7.06		
5/54	382	7.06	15	$ 0.19
6/54	70	.91	349	7.14
7/54			312	6.86
8/54			278	7.11
9/54	46	1.60	94	2.22
10/54	416	8.01	37	.48
11/54	968	15.58		
12/54	1495	22.83		
1/55	1951	28.56		
2/55	1698	25.07		
3/55	1338	20.39		
TOTALS	8753	$137.07	1085	$24.00

In the motel-hotel field it is probable that the "Golden Gate" hostelry at Miami Beach, Fla., is the most outstanding. It is already complete, with 89 residence-type packaged units used for heating and cooling 500 rooms. The combined capacity is 357 hp.

At Lima, Ohio, a new real estate development just getting started, has installed heat pumps in its first two completed houses, and has ordered 78 more.

But most of the thousands of residential units now operating are the result of individual householder interest and are widely scattered, rather than clustered in real estate developments. However, there are certain areas where they are particularly numerous. Notable in this respect are Tampa, Miami, and Jacksonville, Fla., Los Angeles, Calif., Portland, Ore., St. Louis, Mo., and Chattanooga, Tenn.

In many instances, extremely detailed records have been made of heat pump operations in residential use. Especially significant is one of these in a suburb of

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CONCEALED IN A CLOSET is the water-to-air heat pump which provides all-season air conditioning for this Florida residence. Construction costs in such new homes designed for heat pump installations can be cut considerably through elimination of such features as chimneys and fuel storage facilities.

. . . the Commercial Market

SALES of heat pumps for commercial applications in 1956 are expected to be the greatest in history, sharing in the developing boom of the industry as a whole.

Yet, so vast is the potential market for commercial installations that the record sales this year will barely scratch the surface. The 1956 total will be dwarfed by comparison with the volume predicted for the years to follow.

Some fields of the commercial group will be better than others, of course.

Field No. 1 will include shops and stores, restaurants, theaters, individual offices, and office buildings. Here will be the greatest volume of commercial heat pump sales.

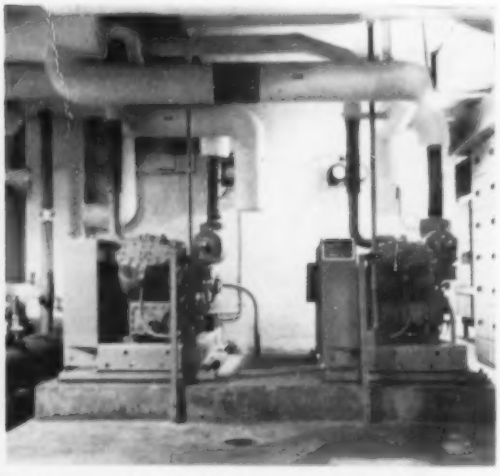
Field No. 2 will include schools and governmental buildings. It cannot be expected to develop as quickly as will the previous classification or ever to achieve a comparable volume. But it may equal or exceed the first field in its ratio between actual sales and sales possibilities.

Field No. 3 will include factories, auditoriums, churches, and miscellaneous buildings. (Hotels and motels are herein classified along with apartments as "residential" rather than commercial.) This third field will have a considerable number of sales, but will not have as high a ratio between its actual and its potential as will the other two.

The basic popularity of heat pumps for commercial use will be derived from a number of factors.

They can be obtained either custom-built or as packaged units, and either way will provide summer cooling as well as winter heating.

Also either way, they will be most adaptable to exacting space limitations. They require no chimneys,



YEAR-ROUND CONDITIONING is supplied for employees in this telephone exchange and office building at Ashland, Ky., by a custom-built heat pump installation powered by two 30-hp compressors. Note electric control panels on wall at right.

an important consideration in new buildings, and sometimes a decisive factor in old buildings. Centrally located, they can use ducts to obtain desired distribution. But if ducts are undesirable or impractical, packaged units can make such lines unnecessary. The packaged units may be installed in multiples as well as singly, and the multiples may either be grouped as a battery or scattered to a number of locations.

Freedom from problems of fuel delivery and storage is another factor that will be a heat pump selling point.

Original cost also will frequently favor them wherever both cooling and heating are required. Even operating costs will be satisfactorily competitive, although this factor will vary according to climate. (See also: "The Heat Pump — Where Most of Them Will Be Sold.")

Retail Stores Will Be Best Customers

The prediction that the greatest commercial sales will be in Field No. 1 is based primarily on the fact that in a considerable part of this category the summer comfort of *customers* is a vital consideration. That means an extremely high percentage of these places will find it increasingly necessary to provide some form of year-round air conditioning. In turn, it means this field will naturally be tops not only for heat pumps but also for conventional summer-winter combinations which use gas or oil for heating.

In this field, custom-built heat pumps will be highly popular for large new buildings for several basic reasons already given. But it is likely that the second greatest factor will be the adaptability of small package units — either singly or in multiples — to the architectural limitations of large old buildings, and to new buildings in which it is desirable to operate different sections on an independent or convertible basis.

The sales ratio in Field No. 2 should rank high, partly because of supplementary reasons also. In the case of governmental buildings, the general desirability of year-round air conditioning will apply. In the case of schools, the inevitability of large building programs in the future will be combined with problems of architectural economy to encourage the sale of heat pumps.

The increasing use of one-story construction for schools will mean some advantages for packaged heat pumps because separate units may be used for different zones without any chimneys, and usually without ducts. Also public pressure may encourage heat pumps for schools on the grounds that they are free from danger of explosions and reduce the hazard of fire. Finally, packaged heat pumps are highly suitable for temporary buildings which often are required for schools.

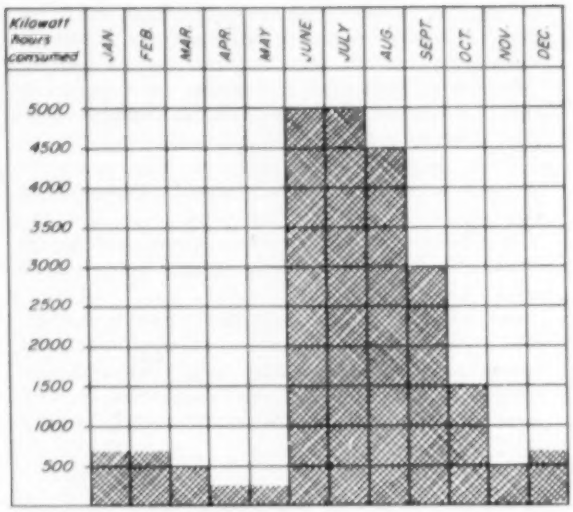
The third field will be relatively less productive for heat pumps for a number of reasons. In the first place, many factories are completely unsuitable for summer cooling. Also, where pressure is the greatest for maximum "take-home" wages, there may be less willingness on the part of employers to provide "niceties" such as year-round air conditioning. Yet there certainly will be numerous heat pumps installed in factories, especially where year-round air conditioning is important for the products and produciton as well as for the comfort of personnel.

Probably just as numerous as factories, or more so, are the churches which also are included in this field. Here there is a growing realization that summer cooling will greatly encourage attendance, and an increasing number of churches are considering year-round air conditioning. But the pressure to justify the investment is not nearly as great in an institution where extremely high summer temperatures need be

Continued on page 96

COMFORT FOR CUSTOMERS in this Canton, Ohio, furniture store is provided by nine packaged heat pumps totaling 38 hp installed on this one display floor. Some units are free standing, while others are concealed behind invisible access doors.

IN NORTHERN AREAS, 14 conventional year-round air conditioning units, not using electricity as a heat source, prove to be heavy consumers of electrical current in summer months but offer no comparable revenue to the utility in winter, thus building up an annual load pattern like that shown in graph at right. Unshaded areas indicate amount of unused electrical capacity which is thus created.



. . . Utilities will welcome it

IN the early stages of heat pump development, many people worried about what the attitude of the electric utility companies would be toward a large-scale installation of these devices. Would the companies make adequate power available? Would they respond quickly to applications for service? Would they take the attitude that heat pumps—to them—are *undesirable?*

Today, there are still many persons who need specific answers to those questions. Yet not many companies have made a general broadcast of their conclusions. A few have not yet made up their minds. But the vast majority will be found to be highly favorable.

Whether or not the favorable attitude is merely temporary, however, can be ascertained only by analyzing the facts that the companies will ultimately consider.

What has assured the favorable outlook of companies located where any form of year-round air conditioning is desirable for home-owners has been the impact of summer cooling on electric current consumption. Years ago, the total load on generating plants almost everywhere was far heavier in winter than in summer. Now, almost everywhere, it is the summer load that is heavier than winter.

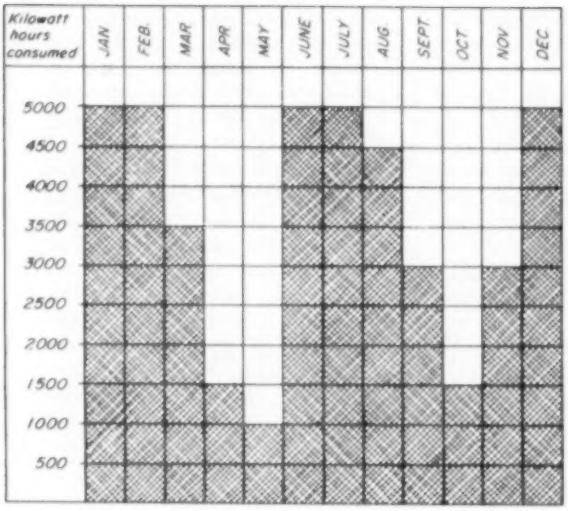
Such imbalance is undesirable from the standpoint of the utilities because it means their total investment in plant and lines must be large enough to handle the peak season, but then cannot be matched by satisfactory revenue in the "off" season.

For that reason, the electric companies — almost everywhere — will welcome any development that requires greater consumption in winter than in summer, and nothing holds so great a prospect for thus helping to achieve seasonal balance as the now-developing boom in heat pumps.

Yet, even with the increasingly large number of heat pumps now forecast it will be many years before this factor can offset the effect of systems which use electricity in summer but which use gas, coal, or oil for heating in winter. Thus, for a long time to come, there will be no danger of the new enthusiasm of the electric companies for heat pumps to be modified.

The supporting evidence for the foregoing conclusions is obtained only by considering the impact of heat pumps on a regional basis.

In some parts of the South, a residential heat pump will consume about 3750 kwh in winter, and about 1250 kwh in summer. Applying those figures to the forecast that ultimately — in the South — there will be three installations of residential heat pumps to



IF HEAT PUMPS were used to replace three of the 14 conventional year-round units, a far closer approach to summer-winter balance in total consumption of electrical current would be achieved, as indicated by graph at left, thus greatly improving the operational pattern of the utility.

match every five installations of other forms of year-round air conditioning, it will be evident that the combined eight units will consume 10,000 kwh in summer, while the three heat pumps will consume 8250 kwh in winter. Thus, in this region, heat pumps by themselves cannot overcome the imbalance, but they can be at least a major step in the desired direction.

Also, it is important to take note that in providing facilities for the individual heat pump, there should be ultimately no need in the South to provide for an extreme *peak* demand in winter. Where outdoor temperature doesn't go lower than 15 F, or where underground water is used (with still more favorable temperatures), there should be no need to use electricity for auxiliary heating. Without such auxiliary use of current, the winter peak demand of a residential heat pump would be about the same as summer. (See also: "The Heat Pump—How It Gets Its Winter Efficiency.")

Peak Load Problem Can Be Solved

Among various proposals for dealing with the peak load problem in areas where auxiliary heat is sometimes needed is the idea of providing capacity sufficient at the individual residence to take care of normal heat pump demand simultaneously with the operation of an electric kitchen range, but with an automatic cut-off installed so that resistance coils of the pump would not operate in the periods when the range was being used.

Except in areas where relatively few people desire summer cooling, the seasonal load problem of the electric companies and their welcome to heat pumps will be found about the same in the North as it is in the South.

In the North, a residential heat pump may consume about 8000 kwh in winter, and about 1150 kwh in summer. Thus, each unit in the North can have a much greater impact in building up total winter sales of current.

If, as predicted, 10 years from now there will be some kind of year-round air conditioning installed in two out of every three new houses, and if there is a ratio of 3 heat pumps to 11 other types of year-round units in the North, as also forecast, the combined summer consumption of the 14 will be about 16,100 kwh, while the combined winter consumption of the three heat pumps will be about 24,000 kwh.

On that basis, there would be a net winter gain in electric consumption of about 2633 kwh for each heat pump installed. But at that rate it would be many years before the total number of these units could offset the millions of the other types of year-round air conditioning which have been already installed.

Encouragement for Heat Pumps Seen

Also it is significant that the cost of providing line and plant facilities to handle a 15-kw peak requirement of a typical residential heat pump in the North (when it operates most of the winter at only 5 kw) will be no general stumbling block to the utility companies. Since even the maximum predictions are for a ratio of 3 heat pumps to 11 other types not using electric-source heat, it follows that in an average dispersion it will be usually possible to maintain that ratio at transformer-point. On that basis, about 42 kw capacity at a transformer would be sufficient to handle the peak load of 14 cooling units, while about 45 kw would be adequate in winter to handle the peak of 3 heat pumps.

Similar encouragement for heat pumps by electric companies in the so-called "border" area of 12 states and sub-states can be predicted without further basic analysis of the contributing factors because they are simply an average of those already found favorable in the North and the South.

In the border region, the average consumption of a residential heat pump may run about 5750 kwh in winter, and about 1200 kwh in summer. Thus, on the basis of 3 heat pumps to every 7 units of other type year-round air conditioning, as predicted, the summer consumption of the 10 combined would be 12,000 kwh, while the winter consumption of the 3 heat pumps would be 17,250 kwh.

In any of the three main regions of the nation, perhaps the only reluctance of electric companies to install heat pumps will be in neighborhoods where the installation would upset an existing winter-summer load balance.

Conversely, it is probable that the local areas in which the companies will most welcome heat pumps will be in neighborhoods where there is presently an excess capacity in the main lines and weakness in the winter consumption, or in entirely new housing developments where the supply lines can be originally built to meet the requirements.

and production techniques which would open the doors of America's great mass markets.

Perhaps the greatest boost came in the introduction of the four-way valve into the refrigerant circuit. This permitted a single combination of condenser and evaporator to perform the functions of both cooling and heating—a job that otherwise required either a double set of these components or else a complicated double set of refrigerant tubing. This development made possible a considerable reduction in the price of heat pumps and in their previous excessively bulky size.

Another important achievement contributing to the birth of a heat pump boom was a series of performance improvements in models which obtain a "bonus" of heat from the outdoors winter air, in contrast to those which obtain it from underground water. Previously, the expansion of heat pump usage had been largely limited to areas where water was inexpensively available. But satisfactory performance of air-to-air models meant that heat pump usage could expand almost anywhere.

1955 Sales Significant

When it comes to the rate of increase in the numbers of heat pumps already installed, the evidence of the birth of a boom is even more impressive.

Although 22 years have passed since the first non-laboratory installation of a heat pump in America, the total installations in 1955 alone were greater than the combined totals of all the intervening years.

According to Edison Electronic Institute, the combined total up to 1955 was approximately 4300 while more than 4500 units were installed last year.

Under closer analysis, the figures for last year are even more significant of the trend. For example, there was the 1955 order for 431 heat pumps for an entire community of residences at Fullerton, Calif. As there were only about 71 units in California prior to 1955, this single community multiplies the whole state's total by more than 700%.

Likewise, there is the case of Sharon Homes, Inc., at Lima, Ohio. This is ultimately to be a 220-house development in which the first group of 80 units were committed in 1955 to have heat pumps for year-round conditioning. Here again, a past-and-present comparison brings out the fact that the entire state of Ohio had only about 51 residential heat pumps before 1955—fewer than the number now being installed in a single local subdivision.

Multi-Unit Sales Grow

Another outstanding example is found in Miami Beach, Fla., where 89 packaged heat pumps were recently installed in a new motel.

Examples of commercial installations are also indicative of the accelerating increase. Among the numerous custom-built units in the 1955 group, a 60-hp installation in the new building of the General Telephone Co., at Ashland, Ky., is typical.

The facts of what is going on in field and factory are, however, only the exterior evidences that certain conditions favorable to a boom are in existence beneath the surface. The nature of these causative forces is easy to discover, and in them is found the strongest evidence of all to demonstrate how great the newly-born boom is going to be.

Trend to All-Year Comfort

The first of the favorable forces is the product of two related facts. One of these is the increasing acceptance of the concept that summer cooling of homes and commercial places is a normal—rather than an extravagant—component of the modern American standard of living. The other related fact is the logic, easily perceived by potential customers, that if one is to have both summer cooling and winter heating, there will be natural advantages of having them combined—either as a heat pump or as some other form of year-round conditioning.

In turn, now that more and more millions of present home-owners and future home-builders are ready to compare heat pump costs with the *combined* costs of separate conventional systems of heating and cooling, the competitive status of the heat pump is sharply improved.

On top of that is the new ability of manufacturers, dealers, and contractors to prove by demonstrations of conveniently located installations that the cost of heating with heat pumps is far less than once was commonly supposed.

The final force opening the doors to a heat pump boom is the general condition of national prosperity. Literally millions of Americans who could not have afforded to include the cost of this device in the total price of a house a few years ago, are now able to regard the cost of year-round air conditioning with a high degree of equanimity. The costs of heat pumps are down at the same time that incomes are up.

Easy Payment Terms Help

Further modifying the basic factor of first cost is the supplementary fact of the easy terms on which present home owners and future home builders can readily obtain long term credit for the purchase of such equipment.

The conversion of all these factors into their ultimate significance in terms of actual sales predictions requires supplementary analysis of them on a regional basis—as is done in an accompanying article.

But even without that regional breakdown, the factors as already cited are sufficient to support the overall predictions that:

1. The day is no more than 10 years distant when year-round conditioning of some kind will be installed in 2 of every 3 new houses —about 660,000 out of the predictable 1,000,000 units annually of new construction.

2. Since 660,000 is a reasonable estimate for *all* types, then 190,000 to 200,000 is equally reasonable as a predicted annual total for residential heat pumps—especially in view of recent improvement in the factors favorable to them.

3. Since many of the factors for such large future totals are already applicable, an estimate of 10,000 residential heat pumps in 1956 is soundly conservative—limited chiefly by the equally conservative policies applied in the

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Get in on the ground floor. Experts say that in 10 years most year-round air conditioning systems will be the heat pump type. You'll be the recognized authority in your area.

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G-E Weathertron market is a quality market. You're free of "deals" and price wars. Your customers are community leaders. You gain prestige in serving them.

Increase your profit. With Weathertron, it's possible for you to enjoy 3 to 4 times your normal gross yearly sales—without increasing your overhead. Weathertron gives you the opening to a new, high-calibre market... avoids "cut-throat" competition.

G-E Weathertron is a complete package. Factory assembled and tested. Installation labor a minimum—you can estimate costs without risk. Don't need sub-contractors for piping, wells, water towers.

No large investment in stock. G-E Weathertron is warehoused locally. Replaceable refrigerant cycle is covered by full 5-year warranty. Your investment is a minimum!

No shaky marketing policy. You're likely to have the heat pump field to yourself in your area for some time. G.E. is way out in front! And market objectives are clearly defined—sales and service policies strictly adhered to.

Strong development program. General Electric's unique "Weathertronics Institute" provides the know-how for successful selection, sale, application, servicing.

Powerful national advertising and publicity program now building demand. You get the inquiries.

Utility support. More and more electric utilities are actively boosting Heat Pump sales. Their enthusiastic support makes your job even easier.

"Plus" selling benefits come your way when you join the General Electric team. You enjoy the sales advantages inherent in the G-E Monogram and Trade Name. You are a member of the team that has *all* electric products for "all-electric living"... a team that emphasizes and promotes all-electric living on a national scale.

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year-to-year expansion of production facilities.

4. With the same factors applicable to commercial heat pumps, the increase in number of installations in this category will be at the same *rate* as in residential units except in 1956 when the commercial number will bulk larger than normal.

As a matter of fact, some of the recognized authorities in the field of heat pumps today are predicting considerably larger sales for 1956 and for subsequent years than have been given herein. And, as the accompanying regional analysis of the market will show, it is the larger figures which may prove more nearly correct.

On the other hand, there are some manufacturers and others who have made smaller estimates in their admitted desire to lean over backwards for the sake of conservatism. Yet even the estimates of these super-conservatives are only slightly smaller than the predictions herein.

Give or take a little — either larger or smaller—the conclusion remains inescapable that 1956 will mark the beginning of an extended period in which the heat pump industry will hit the proverbial jackpot.

SELLING CAN BE FUN

IT WAS A CIRCUS for visitors to the exhibit of Mueller Brass Co. at the ARI Exposition. Romeo and Juliet, a pair of trained sea lions, exhibited their talents at special performances several times daily. In the photo, Juliet balances a plastic ball on her nose as she returns to her perch. Romeo's attitude indicates he's confident she'll make it without mishap.

WHERE THEY'LL BE SOLD . . .

Continued from page 79

1956 is 4650 residential units with 13,950 hp, and 372 commercial installations with 4650 hp. Thus, *in this area of 17 states, the volume of heat pump sales in 1956 should amount to $11,625,000.*

In 11 states and sub-states chiefly of the North-South "border," including Oklahoma, Nevada, Kentucky, southern Missouri, Utah, southern Idaho, West Virginia, southern Illinois, southern Indiana, southern Ohio, and southern New Jersey, the winter climate is slightly less favorable for heat pumps than in the previous list of states. Winter temperatures average about 15 degrees colder and occasionally zero.

Heat Source Is Factor

Of a consequence, an air-to-air heat pump in this area will average a lower coefficient of performance. Its operation at average temperatures will produce perhaps 15% less heat for a given quantity of current consumed. Yet in these in-between states, the heat pump will be required to average a higher output of heat, and a slightly longer season.

The net effect will be a seasonal cost of perhaps $80 to $110 to heat a well insulated house of 1000 sq. ft. Hence, the operating cost factor, compared with a unit burning oil, gas, or coal, will be challenged by the heat pump's rivals.

An exception to the case of the air-to-air heat pump will be other heat pumps which extract their heat bonus from underground water. As underground water has a higher temperature than the air in winter, and has a lower temperature than the air in summer, the year-round operating efficiency of these water-to-air units will run higher than air-to-air models. However, the lack of adequate water in some areas, the cost of drilling deep wells, and other factors suggest that the considerable popularity of water-to-air units will be largely confined to specially favorable localized areas where their ratio to other types of year-round conditioners will run about the same as the figures indicated for air-to-air heat pumps.

While the summer in this "border" area is not as long as further south, there is still a considerable period in which heat and humidity create discomfort which can only be countered by a cooling system. And, the same as in other areas, the original cost of a heat pump (or any other year-round system) is easily made "pain-less" by credit terms, especially in new construction.

Bonanza for Builders

Hence, theory again correctly allows that it would be *practical* for as many as 90% of the builders of new homes here to install some kind of year-round system. The volume of such construction—roughly proportionate to population—here runs about 16% of the nation's total, and thus can be predicted as about 160,000 new houses annually.

But again an arbitrary allowance should be made to cover the certainty that—10 years from now—there will be 5 out of every 15 new home owners in this area who will content themselves with heating only. That is really saying that in view of the desirability of summer cooling and the financial ease with which it may be obtained, it is inconceivable that 10 of every 15 new home owners will not be content with anything less than some form of year-round conditioning.

Competition Will Be Keen

However, the competition between heat pumps and systems having separate heating and cooling units will be somewhat greater in this area because of the climate factor. Accordingly, allowance is made for that differential by reckoning 7 new home owners in every 15 will choose some form of heating-cooling other than heat pumps, compared to 5 out of 12 in the South and Pacific Coast area. That would mean 3 heat pumps in every 15 new houses in the "border" area. Also, it shows a ratio between heat pumps and other forms of heating-cooling in this area as 3 to 7, instead of the 3 to 5 of the region where the climate is milder.

Thus, on the basis of 160,000 new houses annually, residential heat pump sales in the border region should amount to 32,000

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units in 1965—about 16.5% of the nation's total. Paralleling that residential total with its 96,000 hp would be 1280 commercial installations with 5760 hp. That would make the *combined 1965 annual total $57,280,000.*

With the 1965 ratio between this region and the national total (about 16.5%) applied to 1956, the current year's volume in the border area should amount to 1650 residential units with 4950 hp, and 132 commercial installations with 1650 hp. That would give this region a *1956 total of $4,125,000.*

Going Tougher in North

About 48% of America's total population resides in the remaining area of the nation—the North. Here, new house construction will run about 480,000 units a year. But—for heat pumps—the climate will make the going tougher.

Nevertheless, even in the North, the predictable sales of heat pumps will reach amazing totals.

Almost anywhere in this area, there are upward of 50 hours of below zero weather in a normal winter, and in some places 300 or 400. This means that any heat pump of reasonable size will be able to supply adequate heat only by considerable use of supplementary resistance coils, and that the seasonal cost of current for heating will be perhaps $40 or $50 higher for an average house than in the area of in-between climate.

Operating Cost a Factor

In upper New England, Minnesota, the Dakotas, and Montana, the differential would be still greater—so much so that few people may be expected to be heat pump users there.

On top of the winter operating cost factor, there is slightly lower pressure in much of the North than elsewhere for summer cooling. Yet in general the top temperatures of a northern summer are quite as difficult to endure as they are in the South. This fact, hitched to the relative scarcity of can't-afford-it families in the North, means that the sale of summer cooling in this region will continue to run very high. The same as in the other areas, the day is not distant when some cooling as well as heating will be supplied in the North for 2 in every 3 new houses.

But how many of those northern homes with year-round service will use heat pumps will surely be a matter of fierce competition between manufacturers of heat pumps and those who make year-round combinations using gas, oil, or coal for winter fuel.

Ultimately, the heat pump makers expect to be able to offer their residential product for a considerably lower first cost than one of the alternative combinations. But the makers of the latter expect always to be able to offer the inducement of lower operating cost in northern winters.

Thus, the total factors favoring heat pumps in the North are at a somewhat lower level than in the other two areas. It is reasonable to expect that 2 in every 3 new homes in the North will ultimately be constructed with some form of year-round conditioning but whereas the ratio between heat pumps and other forms of year-round conditioning can reasonably be estimated at 3 to 5 in the most favored region, and 3 to 7 in the border region, it probably should be figured at 3 to 11 in the North.

"He hasn't spoken a word since you sold him that air conditioner — all he used to talk about was the weather!"

That would mean 7 new houses in every 21 would have heating only, 3 in 21 would have heat pumps, and 11 in 21 would have some other heating-cooling combination. With 500,000 new houses constructed annually, 71,000 of them would be equipped with heat pumps—about 37% of the nation's 1965 total.

Those 71,000 with 213,000 hp would presumably be matched by 2840 commercial installations with 12,780 hp. Thus, the total *1965 volume in the North would be approximately $127,090,000.*

Based on the national estimates, the *current year's total in the North (37%) should be 3700 residential units with 11,100 hp, and 296 commercial installations with 7300 hp, with a combined value of $9,250,000.*

Commercial Phase Important

Allowance for "alteration" installation of heat pumps in residences and commercial places is included in all the foregoing estimates. In the case of commercial jobs, it is assumed that replacements of old equipment of other types will form a considerable part of the total during the next 10 years, and especially in 1956. In the residential field, it is assumed that such replacements will form a smaller part of the total.

For a few years it is possible that alteration jobs may form as much as 20% of the commercial total, and as much as 10% of the residential volume. But gradually these rates will taper off as the number of replacement possibilities is reduced and as the total of installations in new construction increases.

It is also assumed that the estimates for 1965 will be close to the maximum, except for increases paralleling gains in population, although some leading persons in the heat pump field look for national totals as much as 25% higher than those given here. After the maximum is reached it then is likely that the heat pump volume will remain on that high plateau without any foreseeable time limitation.

BORG-WARNER ACQUIRES PRIMOR PRODUCTS, INC.

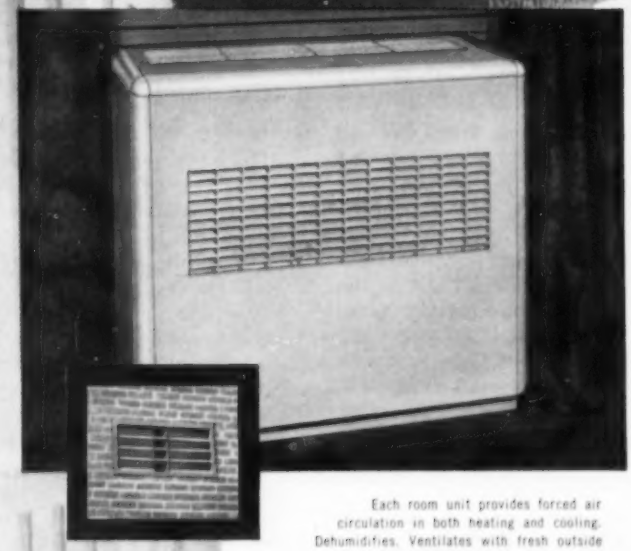
Borg-Warner Corp. has acquired Primor Products, Inc., Adrian, Mich., contract manufacturer of refrigeration units for central air conditioning systems. The company will be operated as a Borg-Warner division, and Gorton F. Price, president, will remain with the firm in a consulting capacity.

Only the best thing that ever happened

for year-'round room comfort in commercial and institutional buildings

new RECESSED AIR CONDITIONER

BY **Mueller Climatrol**



Each room unit provides forced air circulation in both heating and cooling. Dehumidifies. Ventilates with fresh outside air, or exhausts stale inside air. Installed on outside walls (most often under windows), the handsome unit extends only 15½ inches into the room. It arrives prime-coated . . . ready for painting to match room decor. Rust-proof and attractive exterior louvre opening (see insert) is flush with the outside of the building.

HEATS
with steam or hot water.

COOLS
with its own air-cooled refrigeration cycle.

CONTROLS
heating and cooling in each individual room with built-in thermostats.

COSTS
about half as much installed as a complete central cooling system alone.

IDEAL
for both new and existing buildings, single or multi-story.

Mail this coupon for Literature

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2055 West Oklahoma Avenue
Milwaukee 15, Wis.

Please send me illustrated literature about the new recessed year'-round room air conditioner.

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Firm Name _____

Address _____

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Circle No. 54 on Reader Service Card

WINTER EFFICIENCY . . .

Continued from page 81

obtained from its motor components. That would make the total 6824 Btu, just two times as much as was purchased in 1 kwh of current. In such case, the coefficient of performance at 15 F would be "2".

Thus, the lower temperature in the second source of heat, the higher is the cost of obtaining a given over-all total of heat. In this instance, it would take 1½ kwh of current to obtain 10,236 Btu at 15 F, as compared to one 1 kwh to obtain the same 10,236 Btu at 60 F.

At the same time, the lower the temperature of the second source, the less becomes the *capacity* of the unit to derive heat from its first two sources. For example, this capacity of a so-called "3-ton" unit consuming 5 kwh in its motors might be 51,180 Btu at 60 F, but only 34,120 Btu at 15 F. Yet 51,180 might be twice as much as needed at 60 F, while 34,120 might be only half as much as needed at 15 F.

A Third Heat Source

To solve the problem of having adequate heat in the few short periods of extremely cold weather, many heat pumps are equipped to use a *third* source of heat—by consuming additional electricity in supplementary panels of resistance elements.

These elements are thermostatically controlled, usually so that some of them will begin to operate when the outdoor temperature is around 15 F, and so that all of them will operate when the temperature is zero.

For heat pumps designed for small homes in areas where such temperatures are occasionally encountered, the maximum consumption of these panels is approximately 10 kwh. Thus, for the short periods in which they are used, they are able to add about 34,120 Btuh to the heat obtained from the other two sources.

Such use of supplementary heat would give the unit a total capacity of 68,240 Btuh at 10 F. If that capacity were fully used for an hour, the unit would have delivered 34,120 Btu from its first two sources of heat by the use of 5 kwh of current in its motors and the additional 34,120 Btu from its third source by the use of an additional 10 kwh of current. The total consumption would be 15 kwh.

On that basis it could be said that the owner "bought" 51,180 Btu (the heat content of 15 kwh), and obtained a "bonus" of 17,060 Btu. In such case, the operating cost at 1½¢ per kwh would be 22½¢ an hour, and the coefficient of performance would be 1.33.

Of course, if the building served did not require as much as 68,240 Btuh at 10 F, the heat pump would produce only as much as actually required, and the cost per hour would be less.

Similarly, at 60 F, the building might require only 10,236 Btu in an hour—only a small fraction of the unit's capacity. In such case, only 1 kwh would be consumed, and the one-hour cost would be 1½¢.

Thus, the rate of consumption varies not only from day to day, or hour to hour, but even from minute to minute, and it is the final combination which is reflected in the total bill for heat. A few hours at capacity load with a relatively low performance coefficient are easily averaged out by a far greater number of hours when the load is light and the coefficient is high.

RESIDENTIAL MARKET . . .

Continued from page 83

Cleveland, Ohio, because this is in the area of really cold winters.

This house is one-story, ranch-style, with about 1000 sq. ft. of living space, plus full basement and garage. Heating and cooling are provided almost as generously for the basement as for the living space. The house is insulated to standards that are normal in modern medium-price homes.

For a full year, a separate electric meter was used for the air-to-air heat pump in this house; also a recording instrument to show precisely the extent to which the operation was divided between heating and cooling. The operating cost then was converted into dollars on a basis of 1.3¢ per kwh plus a demand charge which made the actual rate close to 1.5¢ per kwh.

On that basis, the entire year's cost for heating was $137.07, while the cost of cooling was $24.00. The monthly record is detailed in the accompanying table.

For the heating cycle, the coefficient of performance was computed as follows: Sept., 3.9; Oct., 3.4; Nov., 2.9; Dec., 2.9; Jan., 2.6; Feb., 2.4; Mar., 2.6; Apr., 3.6; May, 2.9.

It is probable that the heating cost was somewhat more than it would have been with a gas-burning unit, and about the same as it would have been with an oil-burning unit. However, this is in an area in which gas rates are relatively low, and where severe winters do not permit a heat pump to operate at maximum economy.

Expense Not Always Factor

To many people, the somewhat higher cost of heat from a heat pump would constitute a decisive factor. But to many others, especially where gas mains are unavailable or where gas rates are higher, the operating cost differential would be unimportant. Both views are probably quite accurately evaluated in supplementary analysis, appearing elsewhere in this issue, indicating that in the northern climate belt the sales of conventional year-round systems using gas or oil for heat, as compared to sales of heat pumps, will ultimately run in a ratio of approximately 11 to 3 among every 21 new houses.

In contrast to this northern example, there are numerous residential installations in the South whose owners attest that their heat pumps give them winter costs at least as low as would be possible with any alternative year-round system.

Thus, the increasing number of heat pump installations and their performance records, coupled with other factors including time payments and prosperity, and with the mounting demand for *some* kind of year-round air conditioning, all point to the conclusion that residential heat pump sales will set a new record in 1956.

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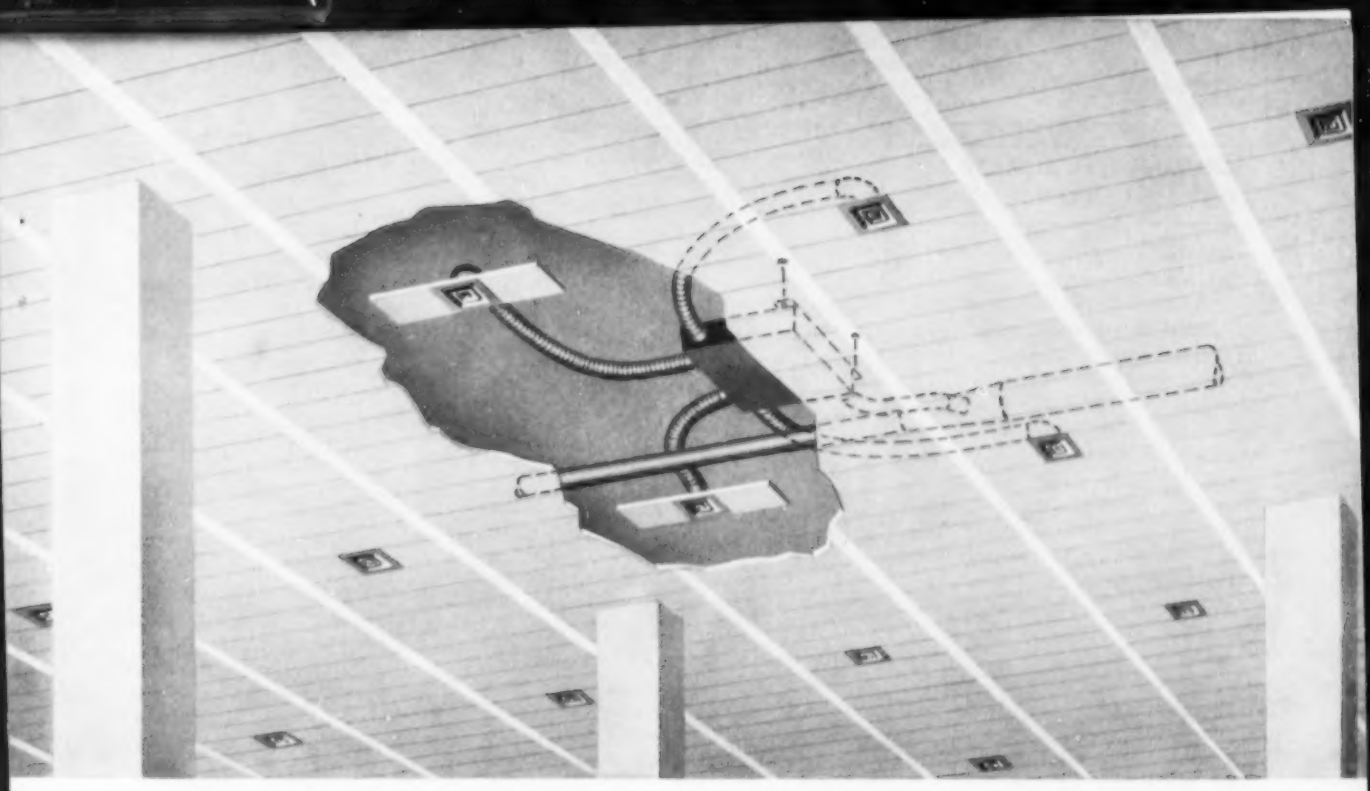
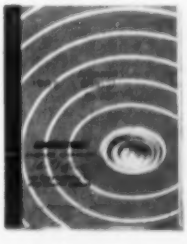


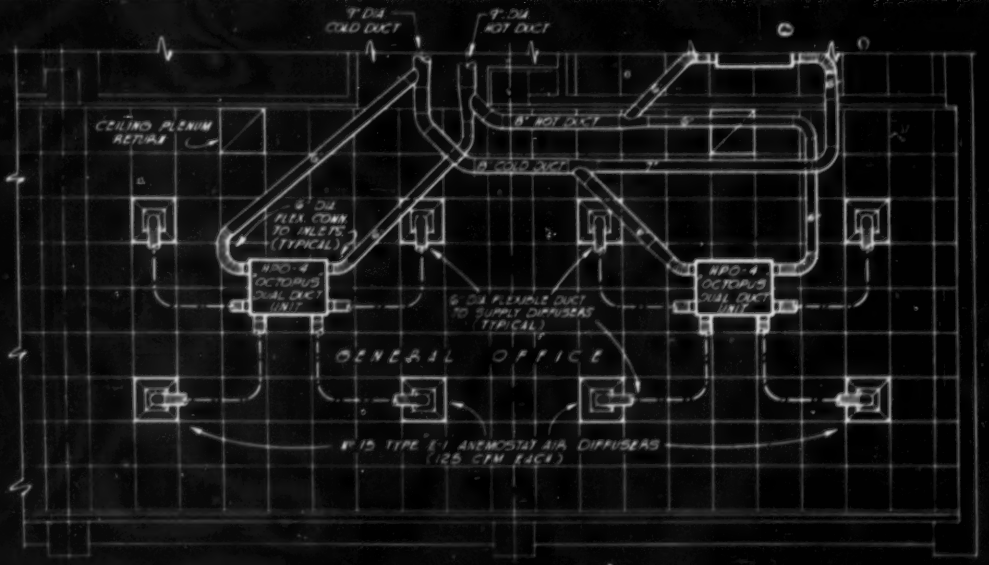
Here's *flexible* high velocity air diffusion

Here's how the new Anemostat Octopus unit works in interior zone air conditioning. High velocity air travels to a sound attenuator volume control unit, which has from *two* to *four* openings. The air is carried from these outlets through flexible hose to Anemostat diffusers. These have the same outer dimensions as the acoustical panels. If the space must be adjusted to meet changing conditions, such as subdivision of the occupied area, ceiling panels and diffusers can be quickly relocated by merely moving the flexible hose.

Air can be supplied to the Anemostat Octopus sound attenuators from a dual-duct system with a thermostat controlling one bay, or from a single-duct system with automatic or manual control.



Write on your business letterhead for Selection Manual 50 which gives full application and specification data on wide range line of Anemostat All-Air High Velocity units. Anemostat Corporation of America, 10 East 39th Street, New York 16, N. Y.


9" DIA COLD DUCT
9" DIA HOT DUCT
CEILING PLENUM RETURN
8" HOT DUCT
8" COLD DUCT
6" DIA FLEX. CONN. TO INLETS (TYPICAL)
HPO-4 OCTOPUS DUAL DUCT UNIT
6" DIA FLEXIBLE DUCT TO SUPPLY DIFFUSERS (TYPICAL)
HPO-4 OCTOPUS DUAL DUCT UNIT
GENERAL OFFICE
#15 TYPE E-1 ANEMOSTAT AIR DIFFUSERS (125 CFM EACH)

Diagrammatic illustration of office building showing Anemostat HPO-4 Dual-duct Units.

endured for perhaps only five or ten hours a year.

Among the hundreds of commercial installations in recent years there are many that could serve as notable examples.

One of these is a six-story office building at Roanoke, Va., with a 225-hp custom-built unit. Despite the relatively large size of this system, its entire heat "bonus" is derived from outdoor air. Also, it is interesting to note that this building uses 512,800 kwh annually for cooling, almost twice as much as the 262,500 kwh it requires for heating.

In contrast, a public library, also in Roanoke, has an 80-hp heat pump and uses 162,200 kwh for heating, compared to 104,100 kwh for cooling.

The case of the Ohio Power Co. office building at Coshocton, Ohio, is also interesting because it uses underground water in the year-round operation of its 35-hp unit.

Uses Packaged Units

The R & J Furniture Co., furniture store at Canton, Ohio, is another significant case because it shows how the use of a number of relatively small packaged heat pumps may be more advantageous in some cases than a single unit having the same total capacity. This establishment uses 9 packaged units, located at different points abutting its main walls, to obtain a combined capacity of 38 hp.

Among the most numerous commercial applications of packaged heat pumps have been in "diner" eating places, beauty shops, and small retail stores. Other interesting applications last year included a police barracks, several medical clinics, banks, funeral homes, transportation waiting rooms, radio-television studios, county courthouses, and a number of schools.

A detailed description of one of the outstanding installations of 1955 will be useful — the case of the General Telephone Co. at Ashland, Ky.

Although close to the northern heavy-winter region, the custom-built heat pump serving this company uses outdoor air in both its cooling and heating cycles. It has performed very well at near-zero temperatures and still had plenty of unused capacity in reserve.

The system functions in a new building of two floors and fully-used basement. The structure is of reinforced concrete, with brick-and-block walls and a very large window area.

This basement-located system, installed by Conditioned Air, Inc., of Charleston, W. Va., has two 30-hp motor-compressor units which operate either separately or combined.

Custom-Built System

Outdoor air is drawn through ground-level openings on the south side of the building by one or both of two 5-hp blowers, each with a capacity of 21,600 cfm. It passes through dampers and mechanical filters, and through a passageway before it reaches the "source" coil.

That coil has a face area of 84 sq. ft., and it is here that the cold refrigerant extracts heat from the less-cold air in contact with it in winter, and from which the warm refrigerant gives off heat to the passing air in summer. After passing through this coil, the source air is returned to the outdoors through another set of dampers.

4-Way Valve Turns Trick

Another coil is located in the distribution circuit of the building's heating-cooling system. In this coil the refrigerant gives off heat in winter and absorbs heat in summer. A blower with 25,600-cfm capacity pushes the building's air through this unit. A 10-hp motor operates the blower, and a second 10-hp motor is in position for quick substitution if needed.

One copper refrigerant pipe extends directly between the source coil and the distribution coil. Another pipe leads from the source coil to a four-way valve. A third pipe is from the distribution coil to the four-way valve. In turn, the valve is connected by two pipes to the pair of compressor units.

The flow of refrigerant between the compressors and the valve is always in the same direction. But the valve, responding electrically to a manually-operated summer-winter switch, reverses the flow of refrigerant seasonally in the remainder of the circuit.

In summer, the refrigerant moves from the valve to the supply coil, then to the distribution coil, and back to the valve; then through the compressor section, and back to the valve. In winter, after leaving the compressor section, it moves through the valve to the distribution coil, then to the supply coil, and back to the valve.

The reversing of the valve could be controlled by thermostat if desired, but in this case a manual control was deemed sufficient. However, thermostats are used to start and stop the compressors, and to regulate the flow of the building's air.

A panel of charcoal filters and another of electrostatic filters are both used in the distribution system. Also there is a smoke detector which would shut off the air flow in case of fire in some part of the building.

As an emergency supplementary source of heat in extremely cold weather, the distribution system contains electric resistance units with a combined capacity of 65 kw. These are arranged to cut in 5 kw at a time. But although the system has operated continuously since Jan. 20, 1955 and has encountered near-zero weather, the operation of the auxiliary heat units has never been required.

Marston V. Shepherd, district manager of the telephone company, is enthusiastic over the heat pump's performance. "I wonder how in the old days we ever got along without something like it," he says.

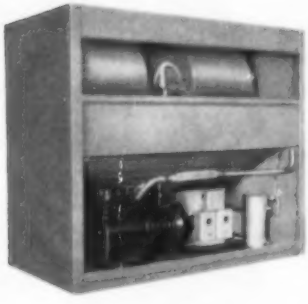
ASHAE ANNUAL MEETING SET FOR JANUARY 23-25

The 62nd annual meeting of the American Society of Heating and Air-Conditioning Engineers will be held January 23-25 in the Sheraton-Gibson Hotel, Cincinnati, Ohio. The meeting will be comprised of eight sessions, during which 16 papers will be presented, including several from the ASHAE research laboratory and cooperating universities. Meeting will be concluded with the annual banquet and installation of newly elected officers.

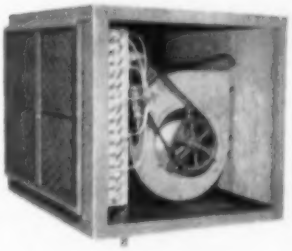
TYPHOON WATERLESS Air Conditioning

2-3-5-8-10 TON WATERLESS UNITS

New air cooled units, easy to install, need no plumbing



When water is short, impure, costly — or where sewer tax is a problem — you can handle the job easily and economically with a Typhoon waterless air-cooled condenser. Units are easy to install and require little or no maintenance . . . deliver full capacity in hottest weather . . . give you a powerful selling plus! Round out your line with Typhoon waterless air conditioners—full range of sizes up to the *exclusive 10 ton unit*.



Superior Typhoon Engineering:

Centrifugal blower eliminates wind resistance factor, overloading of fan motor . . . adaptable to duct work.

Bigger condensing surface—more cooling capacity with less electrical input.

Self-contained or remote installation—for most advantageous positioning.

Non-stop performance even in hottest weather because compressor is never over-loaded.

Quiet—slow speed blower with belt-driven, ball-bearing drive cuts noise level.

Weatherproof design—all components housed inside cabinet for outdoor installation by refrigeration contractor.

TYPHOON *Specialists in Air Conditioning Since 1909*

Typhoon Air Conditioning Co., Inc.
505 Carroll St., Brooklyn 15, N. Y.

I'd like to know more about selling Typhoon Waterless units. Send me Bulletin C-3

Name _____

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Here's your profit opportunity of a lifetime to wholesale to dealers the finest packaged air conditioners... without being forced to overstock *or* sell tie-in products!

You don't have to sell air conditioning; people already want it. You don't have to sell the American Blower name; people respect it, know it through national advertising. *And* you don't have to tie up capital in "too much" inventory with American Blower Packaged Air Conditioners . . . for our low-investment plan lets you buy in less-than-carload lots!

As an American Blower wholesaler, you get this red-hot item – that's competitively priced – for a market that's booming, with no end in sight (and you're not required to handle tie-in products!). In addition, you get the backing of an aggressive, growing company – plus these extras that enable you to more than meet competition: (1) units with 3- thru 20-ton capacities to satisfy practically every dealer need; (2) 5-year warranty on entire refrigeration circuit; (3) national advertising support; (4) liberal cooperative plan for local advertising, and free sales promotion material.

Choice, protected territories are available on a first-come-first-served basis—so mail coupon today for complete data on our stocking plan and franchise—or write, wire, or phone.

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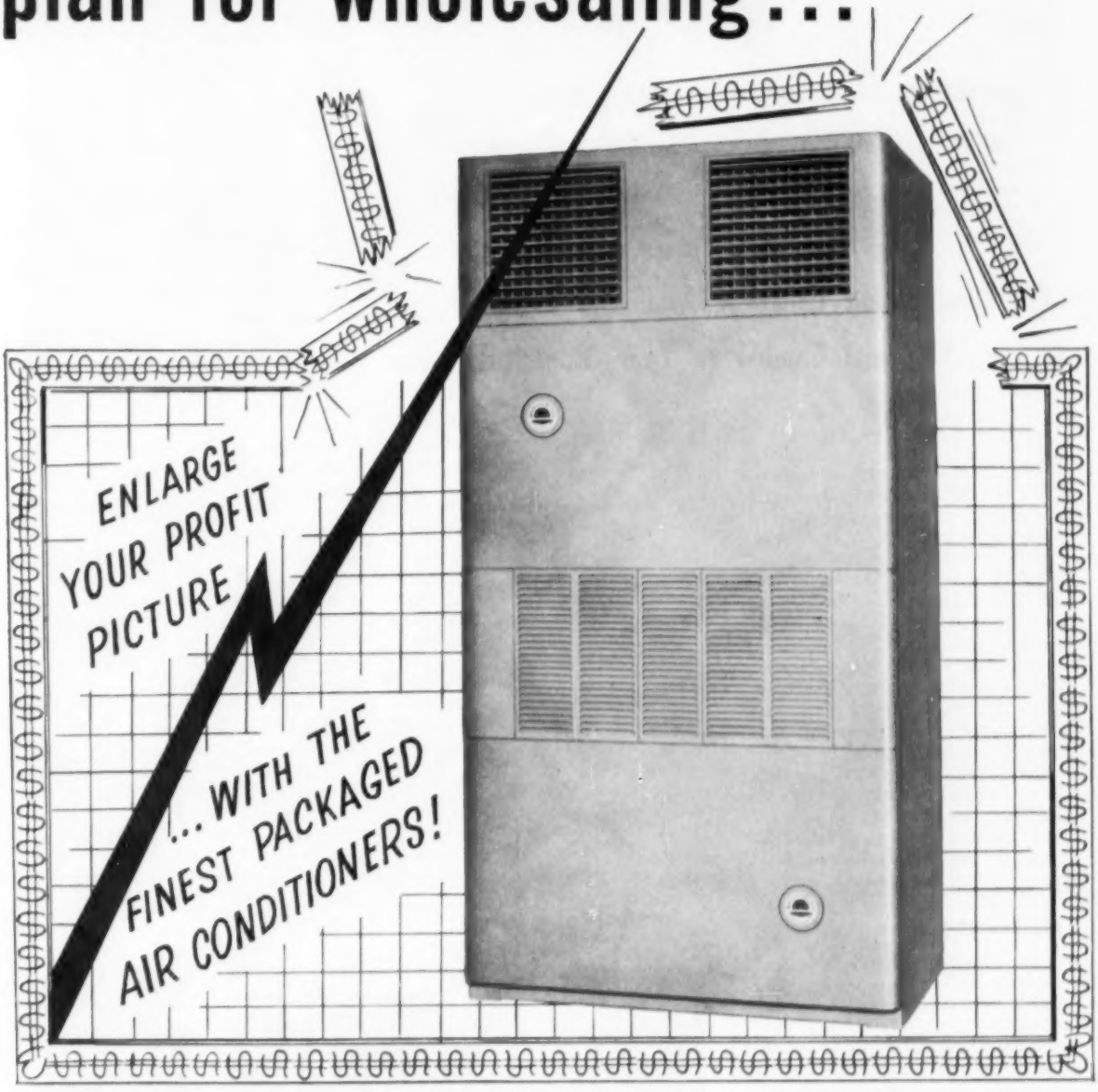
plan for wholesaling...



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Packaged Air Conditioners — that cool without chilling

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Yes! I am interested! Please have your representative call.

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THE COMMERCIAL REFRIGERATION and AIR CONDITIONING APPLICATIONS MANUAL

Readers are invited to submit their problems to this department. Each letter of inquiry will be answered personally by the author. All problems should be clearly and completely stated and addressed to: COMMERCIAL REFRIGERATION AND AIR CONDITIONING, Manual Dept., 1240 Ontario St., Cleveland 13, Ohio.

Air Conditioning Changes Mushroom Culture from Seasonal Gamble to Year 'Round Business

by Arthur H. Farr

THANKS to modern refrigerated transportation and refrigerated fresh produce display cases, persons who have a fondness for mushrooms can enjoy them at the peak of freshness in any season of the year. Today mushroom culture is a substantial and growing business, and an important user of air conditioning equipment. Previously, mushrooms had been grown only when the outside temperature was most favorable to their production, and consequently they were a seasonal item at the supermarkets. Today, however, they are grown commercially 12 months a year and air conditioning equipment—needless to say — is one of the necessities for the successful operation of a commercial mushroom farm.

Method of Culture

The accepted cultural method of growing mushrooms is intricate and precise. Horse manure is piled out-of-doors where it is mixed with lime, moistened and turned over periodically for about a month, to obtain a favorable partial decomposition or "composting" of the mixture. It is then brought into the mushroom house and placed in long flat beds about 5" deep.

The "sweating-out" period, lasting several days, occurs when the new beds are prepared and the house attains a high temperature of 120° to 140° as a result of the manure "working". The house is then ventilated with outside air until it is cooled down to allow the planting of the propagative material called spawn.

After the spawn has "run" in the beds for about two weeks, the beds are completely covered with an inch of rich soil and controlled temperature is required during the entire harvest cycle. The mushrooms appear about four weeks later and production is maintained in the beds for three to four months. The beds are then emptied and the entire process is repeated.

Growth is Rapid

At 50 F mushrooms will grow from a tiny button to optimum size in 22 days. At 60 F it takes 10 days, and at 70 F the period is only six days. The higher temperatures cause the mushroom to be spongy and it usually deteriorates more rapidly when harvested, so most growers prefer to maintain a temperature of 55 F with a relative humidity of approximately 70%. Higher relative humidities cause the mushrooms to develop blemishes as a result of parasitic spot diseases.

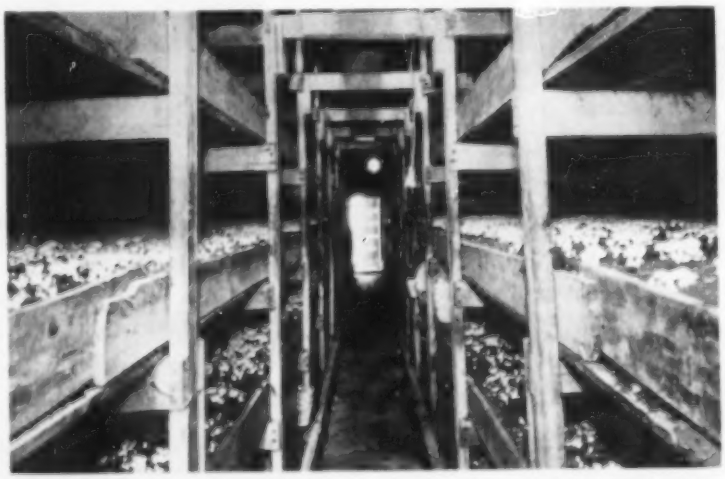
The typical muhroom house is 70' to 80' long and contains 14 beds which are 5' to 6' wide and stacked seven beds high to a height of 14' on either side of a 30" aisle space. A plank walkway about 7' above the floor provides access to the top beds.

The accompanying photograph of the Ohio Mushroom Co. in Lima, Ohio, shows the general layout of the interior of a typical mushroom house. Standard self-contained packaged air conditioners, located outside of the growing rooms, provide satisfactory conditions in this instance at far less cost than central plant systems.

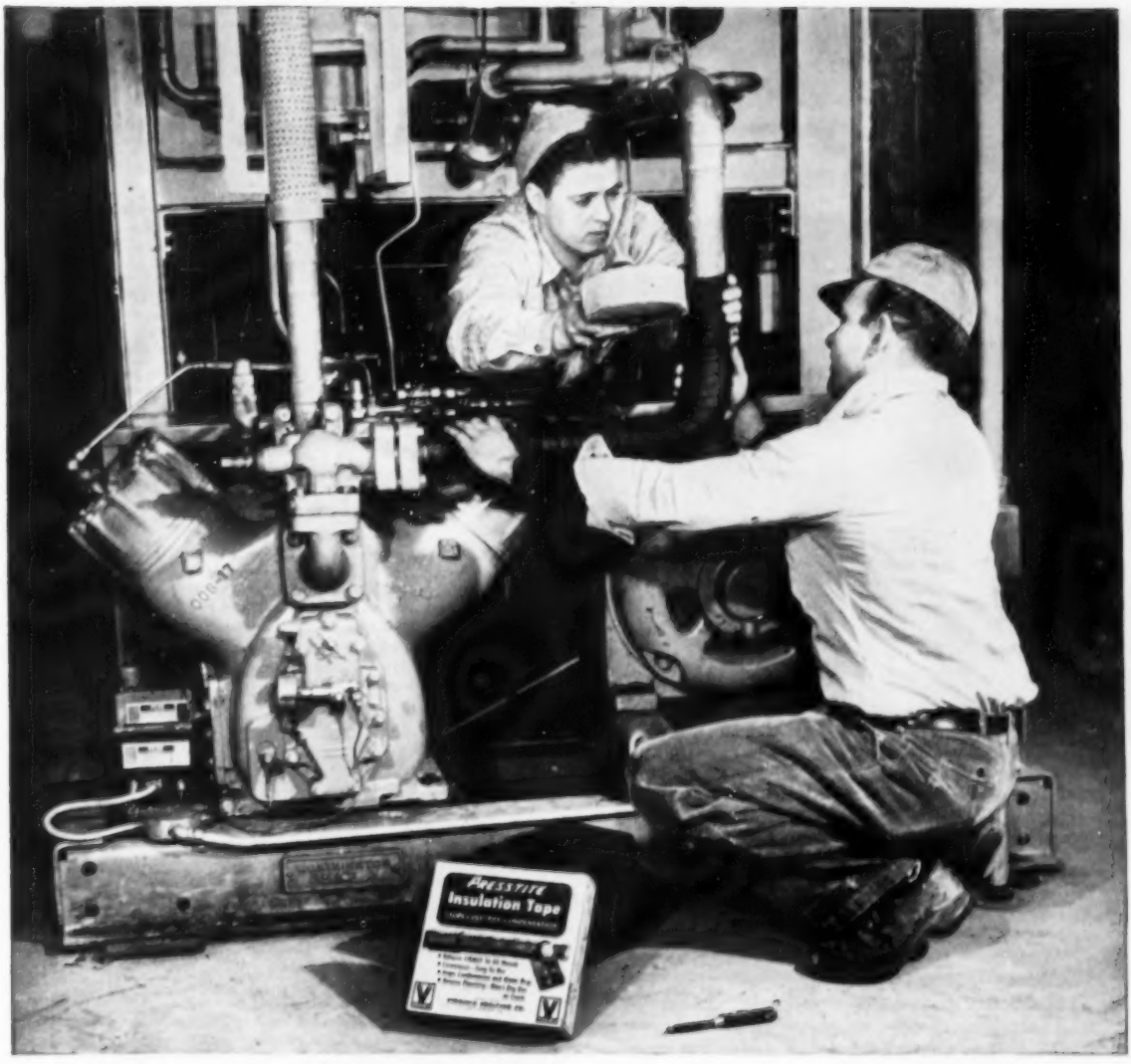
Air Distribution Critical

Air distribution in the growing rooms is somewhat critical, so ducts are run at the top of the house over each stack of beds, and the cool air is allowed to settle to the floor level. Because of the excess moisture and heat generated in the room during the "sweating out" period, it is recommended that the ducts be fabricated of aluminum.

Instead of four-way directional grilles, slots are cut in the side of the duct at fairly close uniform spacing, and the slots should be provided with adjustable slide dampers for the initial balancing of the system. Control of the packaged air conditioners should be maintained with a close differential remote type temperature controller mounted about 7' off the floor in the growing room. In addition to the customary heat gain from transmission through the structural envelope of the room, the internal load as a result of the growing beds must be considered. The heat emission from the beds is calculated at 4 BTU per hour for each square foot of bed surface.



MUSHROOM CULTURE the year 'round is possible by the use of modern air conditioning equipment. The photo above shows a typical such installation. Note how the mushroom beds are arranged in tiers to allow maximum use of the conditioned area.



Presstite Tape stops the drip, once and for all

Cold pipe condensation can make a mess of the finest installation—can ruin walls, woodwork and merchandise—unless you take the precaution to use Presstite Insulation Tape. This solves the dripping problem for good.

Presstite is simplicity itself to use. Just wrap the tape spirally on the surface you want insulated—suction lines, cold water lines, valves or fittings. Presstite Tape can be used on hot pipes up to 165°F, and is ideal for those lines used alternately for cooling and heating. No matter how thin a coating you put on, the joints are self-sealing, and you can build up the wrappings to any thickness you want. No cements or other coatings are ever needed.

Presstite Tape contains 40% virgin cork and will adhere to any metallic surface. It never dries out, hardens or becomes brittle. Each convenient package contains a 30 ft. roll of tape 2 in. wide and ⅛ in. thick.

Get Presstite Insulation Tape from your favorite wholesaler, or write **Refrigeration Division,** VIRGINIA SMELTING CO., Dept. 64, West Norfolk, Va.

VIRGINIA *Chemicals*

ESOTOO • KINETIC CHEMICALS "FREON" REFRIGERANTS
V-METH-L • CAN-O-GAS • PERMAGUM • PRESSTITE TAPE
SUNISO REFRIGERATION OILS

Available in Canada and many other countries

Fittings, too, are easily covered with Presstite.

Prevent trouble before it happens—with Presstite.

Joints are completely self-sealing.

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Installation: Country Club Dairy of Kansas City, Missouri. Truck contains two refrigerated sections: one for milk and dairy products, the other for ice cream.

Cold-Cel TRUCK PLATES provide an even, constant temperature throughout the trip. Milk is delivered refrigerator fresh, with all its flavor retained. The texture and delicate flavor of ice cream are maintained, without shrinkage during handling.

Cold-Cel TRUCK PLATES can carry eutectic solutions ranging from −59° to +26°—available in the following standard thicknesses and connections for any type of installation desired: 4-Connection 2⅛" and 2⅝"; 3-Connection 1½"; 2-Connection 1".

Write for "*Cold-Cels* in Action"—a pictorial brochure—or Engineering Catalog CE.

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SURE SIGN OF BETTER REFRIGERATION

DOLE THE Cel LINE

Cold-Cel TRUCK PLATES

Circle No. 59 on Reader Service Card

USEFUL LITERATURE On Air Conditioning

To obtain the information described below, simply circle on the postcard in this issue the key numbers of the items you wish to receive. We will forward your requests to the companies concerned.

AUTOMATIC CONTROLS for air conditioning and refrigeration applications are described in a complete line catalog recently published by General Controls Co. The literature catalogs for the first time many new controls plus latest improvements and changes in the company's line.

Circle No. 101 on Reader Service Card

COMPLETE LINE of "Rex" air conditioning blowers for 1956 is shown in a new 18-page catalog recently issued by Air Controls, Inc. Seventeen standard belt-driven units are pictured and described, and complete information on the company's universal models is included in the 2-color brochure. Illustrated with photographs and drawings, the literature also lists product features, technical data, and includes comprehensive tables showing complete specifications.

Circle No. 102 on Reader Service Card

DESIGN AND CONSTRUCTION features of Series 551 packaged oil-fired winter air conditioners are clearly outlined in a 4-page illustrated brochure issued by Thatcher Furnace Co. Literature describes advantages of adding summer air cooling units to central winter air conditioners and includes cutaway drawings highlighting salient product features.

Circle No. 103 on Reader Service Card

WATER SAVER that can be used under all climatic conditions is the subject of a new catalog sheet issued by American Comfort Mfg. Co. Complete specifications, as well as design and construction features are listed in the 2-color literature. Literature is illustrated with photographs and a cut-away drawing.

Circle No. 104 on Reader Service Card

WHERE, WHY, AND HOW to use gages and controls is explained in a new 72-page catalog issued by F. W. Dwyer Mfg. Co. A veritable textbook on the efficient measurement of various factors attending the heating, ventilating, and refrigerating fields, the catalog provides valuable technical information, charted data, and diagrams on the purpose and use of specialized instruments and gages manufactured by the company.

Circle No. 105 on Reader Service Card

MANUALLY OPERATED water valves are described and illustrated in a new 4-page bulletin published by Barksdale Valves. The illustrated literature outlines valve characteristics, flow patterns, and gives overall dimensions, and ordering data.

Circle No. 106 on Reader Service Card

HEAT MACHINES are described, and complete specifications and application data are given, in a 6-page bulletin of R. D. Fageol Co. Text of the 2-color literature outlines product features and characteristics. Drawings and photographs illustrate a wide variety of applications for the two models presented in the folder.

Circle No. 107 on Reader Service Card

CASE HISTORY of hospital air cleaning is covered in a 4-page, 2-color application study (No. 114) published by Trion, Inc. The study calls attention to the particular benefits provided by electronically cleaned air, lists various product features, and is illustrated with installation photographs.

Circle No. 108 on Reader Service Card

ELECTRONIC HUMIDITY CONTROLLERS are discussed and technical data pertaining to their selection and use is provided in an 8-page, 2-color bulletin (2273) issued by American Instrument Co., Inc. The folder lists complete product features, specifications, ordering information, and includes selection chart for humidity sensing elements and set plugs. Literature is illustrated with photographs and drawings.

Circle No. 109 on Reader Service Card

ELECTROSTATIC AIR FILTER for use in homes is the topic of an 8-page folder published by American Air Filter Co. Illustrated with photographs and numerous drawings, the 2-color booklet gives complete product design and operation characteristics, specifications, and capacities. It also includes a large diagrammatic drawing that shows entire circulation and cleaning cycle of unit.

Circle No. 110 on Reader Service Card

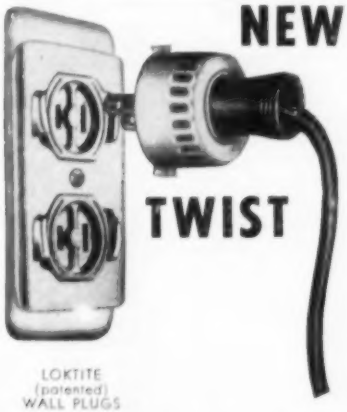
CONDENSED CATALOG, covering their complete line of differential expansion temperature controls, is being distributed by Burling Instrument Co. The 2-color, 4-page folder (G-20) includes photographs of all current types, a description of their operation, general specifications, and an instrument selection chart.

Circle No. 111 on Reader Service Card

(Turn to page 56 for more Useful Literature)

ICE CREAM INSURANCE

NEW TWIST



LOKTITE (patented) WALL PLUGS

Keeps Ice Cream Safe!

Just a twist of the wrist fastens LokTite Wall Plugs securely in place . . . won't work out of perfect contact . . . can't be knocked loose. Small cost and easy, quick installation insure your coolers for life against accidental power interruption. Plate and plug sets fit your present outlets. One loss through failure of ordinary plug could cost many times more than a complete set of LokTite plugs for all your ice cream cabinets.

Over a million LokTite plugs protect dairy products all over the country today.

Try LokTite Wall Plugs for Yourself . . .

Test LokTite performance on your cabinets; trial package of 50 Heavy-Duty LokTite Plugs and 50 Plates, only $22.00
Less than 100 quantity . . . 25 cents each.

LOKTITE MFG. CO.

1670 Pennsylvania Street, Denver, Colorado
Agents and Distributors: some territories open
Circle No. 61 on Reader Service Card

No AIR apparent

When you round out your air conditioning installations with Kno-Draft Type ABC Air Diffusers, there will be no air apparent to your customers. These are the famous *draftless* diffusers—especially designed for commercial installations—that beat grilles all hollow for maintaining equalized temperature throughout the area and assuring customer comfort.

Additional Kno-Draft ABC advantages: Exclusive snap-lock assembly that cuts installation time. Integral anti-smudge cone to assure clean operation. Special gasketing to prevent air leakage. Sleeve-type damper you can adjust *after installation* for required air volume.

Kno-Draft Type ABC Air Diffusers are designed and priced to help you get more jobs, make more profit. Get the full story. Send today for Bulletin K-34. Connor Engineering Corporation, Dept. C-16 Danbury, Conn.

CONNOR ENGINEERING CORPORATION

kno·draft®

air diffusers

CONNOR ENGINEERING CORP.
Dept. C-16 Danbury, Connecticut

Please send Bulletin K-34 describing Kno-Draft Type ABC Air Diffusers for commercial installations.

Name.....

Company.....

Address.....

City.....**Zone**.....**State**.....

Circle No. 60 on Reader Service Card

WHAT'S NEW in Air Conditioning Equipment

For further information on any of these products, simply circle on the postcard provided in this issue the key numbers of the items in which you are interested. Your request will be forwarded directly to the companies concerned.

(For more New Products turn to page 60)

Flexible Conditioner

Product: "Flexi-Cool" air conditioner for limited space installations in homes, stores, and small business buildings.

Manufacturer: Worthington Corp., Harrison, N.J.

Features: Unit is available in 2, 3, 5, and 7½ hp sizes. Complete unit can be remotely installed with duct work extended to conditioned area, or cooling cycle section alone may be added to an existing furnace. Sectional, flexible construction allows for horizontal or vertical positioning, with complete flexibility in arranging air intake and delivery. Where water is scarce, evaporator section may be connected to an air-cooled condenser. For remote installation, blower and cooling coil are installed as a unit, and air or water cooled condensing unit is separately positioned.

Circle No. 151 on Reader Service Card

Winter Weathermaker

Product: New line of "Winter Weathermaker" furnaces readily adaptable to year-round air conditioning.

Manufacturer: Carrier Corp., Syracuse, N. Y.

Features: Complete line of upflow, counterflow and horizontal units is AGA approved for use with all gases, at capacities ranging from 75,000 to 231,000 Btu/hr. Models are also available in oil-fired versions from 91,000 to 231,000 Btu/hr. Vertical model is said to be one of smallest and most compact units available. Stands 4½′ high and is 28″ deep with width varying from 2½′ to 14″; can be installed in alcove closet, basement or utility room with no sacrifice of floor space. Fan switch assures continuous air supply by starting and stopping unit's high-capacity flow fan according to room temperature. Limit switch guards against overheating. Units feature larger filter for air cleaning and new plug-in safety pilot for natural, mixed and manufactured gases. 100% shutoff automatic pilot is used for LP gases. Heating element is die-formed.

Circle No. 152 on Reader Service Card

Horizontal Furnace

Product: Two models of horizontal oil fired winter air conditioner, that can also be used as hi-boy units.

Manufacturer: Thermo-products, Inc., North Judson, Ind.

Features: Model OT8-85 has output of 85,000 Btu, and model OT14-111 has output of 111,000 Btu. "Tuck-away" feature of units permits installation in crawl spaces of reduced size. Models are also suitable for commercial installations such as garages, filling stations, restaurants, and similar establishments. Unit is provided with octagon designed heat exchanger that assures freedom from expansion noises and combustion rumble.

Circle No. 153 on Reader Service Card

Air-Cooled Condenser

Product: New line of remote air-cooled condensers for either floor or ceiling mounting.

Manufacturer: Halstead & Mitchell, Pittsburgh, Pa.

Features: Available in complete range of sizes from 2 through 20 tons. Cabinets are fabricated of heavy gauge sheet steel covered with individual coatings of vinsynite, vinyl zinc, and chlorinated rubber to provide a tough, flexible water barrier. Coils are designed to permit high air volume at low fan speeds, with uniform air distribution throughout core. Units are available with either aluminum or copper fins. All models are designed for multiple circuit operation.

Circle No. 154 on Reader Service Card

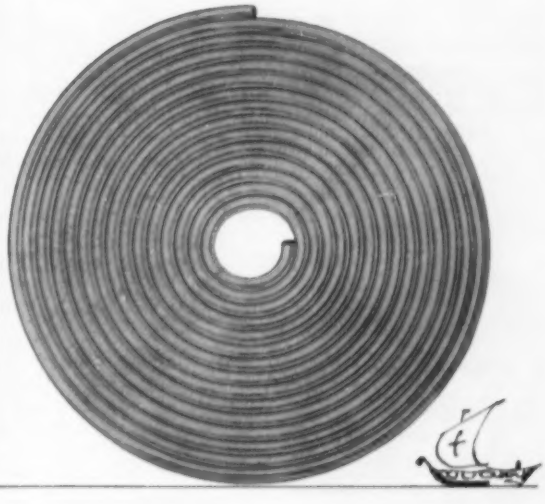
Insulation Wrap

Product: "Kwikwrap" bevelled edge insulation wrap that prevents cold pipe dripping.

Manufacturer: Presstite Engineering Co., St. Louis, Mo.

Features: Product is composed of 100% solids that withstand pipe temperatures from –20 F to 200 F, without becoming brittle or soft. It

a VIKING tradition



Planting a marker or banner on the threshold of a new land was a Viking Tradition. The flag was more than a symbol of conquest — it was a tribute to the indominitable Viking spirit of pioneering. It took brave men with strong convictions to venture into unknown seas in the face of fear and superstition, but through their pioneering new worlds were opened!

Today in the commercial refrigeration and air conditioning industry, a new VIKING has established a tradition for pioneering. Through precision production methods, VIKING has created new standards of quality . . . and VIKING craftsmen, true to the tradition of their namesakes, work to continue producing the finest in copper tubing — a tubing worthy of the name VIKING!

VIKING copper tube co.

CLEVELAND 10, OHIO

PRECISION DRAWN SEAMLESS COPPER AND ALUMINUM TUBING

EXTRA STRENGTH

The proper kind of strength and ductility is vital in tubing used for refrigeration and air conditioning purposes. Copper tube possesses these qualities to a far greater degree than other types of tubing. Its uniform temper assures trouble-free fabrication.

EXTRA FLEXIBILITY

Viking Copper Tube is soft and pliable, yet exceedingly rugged. It saves time and labor because it can be coiled, formed, flared and expanded quickly without danger of fracturing or splitting.

CLEAN AND DRY

Viking Copper Tube is triple-sealed at the ends, stays dry and absolutely dirt-free. The seal is made to pass through any opening large enough for the tube itself. It's clean . . . it's bright . . . it's dry!

Circle No. 62 on Reader Service Card

is entirely self-sealing; requires no cement to apply; and is available in 30′ rolls of 3/16″ and 1/4″ thicknesses, and various widths to accommodate different pipe circumferences. Material is extruded, with bevelled sides, which permits longitudinal application to the pipe. Each 30′ strip is cross cut so it can be easily separated in 2′ lengths. Application involves merely pressing self adhering material around pipe or tubing and joining the bevelled edges to form all-around uniform covering. Eliminates slitting, slipping, and cementing; ideal where application space is limited.

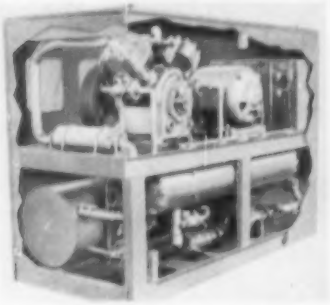
Circle No. 155 on Reader Service Card

Liquid Chillers

Product: New line of "Hydro-Flo" packaged liquid coolers.

Manufacturer: Bell & Gossett Co., Morton Grove, Ill.

Features: Available in capacities from 7½ to 50 tons, each unit is complete in every detail and ready for operation when basic connections are made. Unit is shipped with



complete charge of Freon-12 refrigerant and pre-wired panel box. Other features include non-recycling pump-down and integrated electrical control system. Low pressure drop through evaporator makes possible substantial reduction in system pump sizes. Location of evaporator under the compressor results in lower center of gravity and numerous operating advantages. All parts are easily accessible. Unit may be obtained with an enameled jacket.

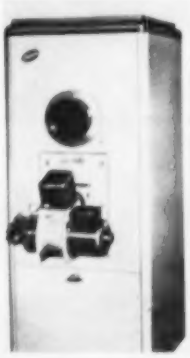
Circle No. 156 on Reader Service Card

Winter Air Conditioners

Product: "Shana-Heat" hi-boy and counterflow oil or gas fired winter air conditioners.

Manufacturer: Shana Mfg. Co., Chicago, Ill.

Features: Units have stainless steel and refractory combustion chambers, aluminum foil-faced glass wool blanket insulation, and all steel one piece body construction. Enclosed baked enamel cabinet has steel base pan and built-in filter rack. All models are provided with automatic controls, including overload protector switches, and are equipped with centrifugal blowers mounted on rubber. Units are de-



signed for front access to burner and all controls. Ten other complete lines of winter air conditioners are also available. These include cast iron units, lo-boy gas or oil fired furnaces, gas fired horizontal units, and gravity furnaces, available from 50,000 to 235,000 Btu.

Circle No. 157 on Reader Service Card

Auto Conditioner

Product: New "Forston, Jr." automotive air conditioner.

Manufacturer: Forston Co., Houston, Texas.

Features: Compact unit has high

capacity and is suitable for cab or under-dash mounting in cars, station wagons, and trucks. Unit eliminates "freezing-up" problems often experienced with under-dash models, and is equipped with three speed fan switch, adjustable directional air flow louvers, and magnetic clutch. Four models are available.

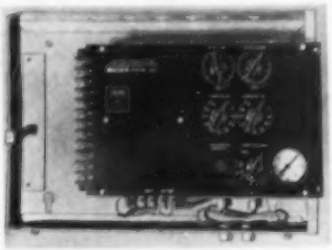
Circle No. 158 on Reader Service Card

Electronic-Pneumatic Relay

Product: Model RO7900 relay combines best features of electronic temperature sensing with conventional pneumatic valve and motor operation.

Manufacturer: Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Features: Relay consists of three interconnected units: a bridge assembly, amplifier, and a relay-actuated valve unit. Bridge and amplifier assemblies are mounted on a hinged panel permitting easy access to valve unit and vacuum tubes. "Printed" wiring circuits are used in the electronic portions of the panel and are connected through plug-in connector strips for easy servicing or



removal. Device is used with conventional 500-ohm electronic thermostat which can be mounted in place of existing pneumatic instruments. If desired, outdoor and discharge air thermostats can be provided to give electronic "team" thermostatic control.

Circle No. 159 on Reader Service Card

Self-contained Conditioner

Product: "Dynapac" self-contained package air conditioner.

Manufacturer: Union Asbestos & Rubber Co., Chicago, Ill.

Features: Available in both water and air cooled models, the new unit is designed for commercial in-

stallations and is available in 2, 3, and 5 hp models. Unit has a built-in plenum chamber, high capacity blower, and a series of individual louvers in the discharge grille can be adjusted to move air in any direction desired. Operation has been simplified by locating push-button controls behind name-plate, which is positioned to eliminate stooping or bending. All models are equipped with standard connections, enabling

them to be used with duct work. Compact all-steel cabinet has coppertone finish and is heavily insulated on all sides.

Circle No. 160 on Reader Service Card

Dehumidifiers

Product: Line of central station type sprayed coil dehumidifiers.

Manufacturer: American Blower Corp., Detroit, Mich.

Features: Units are available in standard arrangements having 1, 2 or 3 coils high and from 4 to 8 coil rows deep. Finned tube length can

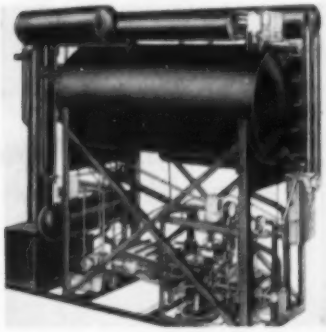
vary from 2 to 10 ft.; coil face area from 4 to 83 sq. ft.; and capacity from 2,300 to 45,900 cfm. Models are of heavy construction and provide complete accessibility and ease of maintenance. Units are provided with removable coils for either water or direct expansion refrigerants and are equipped with self-cleaning, centrifugal type spray nozzles.

Circle No. 161 on Reader Service Card

Water Chiller

Product: Packaged 25-ton steam-operated water chiller that incorporates its own operating controls.

Manufacturer: Servel, Inc., Evansville, Ind.



Features: Completely factory-assembled, the unit requires only simple steam and water connections plus a 115-volt electric line to operate the controls. Chiller is compact, lightweight, virtually vibration-free, and provides chilled water for numerous air conditioning, process cooling, and industrial cooling applications. Built-in controls are regulated by a thermostatic bulb in the chilled water line, and provide continuous, automatic modulation to meet varying load conditions.

Circle No. 162 on Reader Service Card

Remote Conditioners

Product: New line of remote-type air conditioners for residential and small business applications.

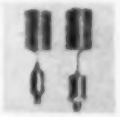
Manufacturer: Frigidaire Div., General Motors Corp., Dayton, Ohio.

Features: Units are offered in 2, 3, and 5-ton capacity sizes. Each

model has a well-insulated cabinet, which contains filters, multipath

WATSCO REFRIGERATION AND AIR CONDITIONING PRODUCTS

TERMINAL SEALS
Slip seals instantly and permanently. No special tools required. Available from stock for most units, or can be made up special at no extra cost.



STRAIN-O-KAP
5-1 and 5-2. A superior strainer-capillary tube combination for sealed and open units. Triple mesh screens (40, 80 and 120) for triple straining action. 5-1 strainer made of hard drawn span copper tubing. 5-2 strainer shell made of non-ferrous brass. No cutting or adjusting required - for all units up to 1/3 H.P.

MAGNE-CHEK VALVE
Non electric magnetically operated check valve with new T-S connection. No springs, no back pressure. Three styles: - part No. MTS 4 (1/4"), part No. MTS 6 (3/8") and part No. MTS 8 (1/2") offer 61 possible connection combinations; may be soldered or flare connected.

HU-BEAD
The original replacement door gasket. New improved adhesive backing studies from speed in replacing door seals on Frigidaire, Coldspot, etc. No need to dismantle door.

2 IN 1 DOOR GASKET HOTCHER
With the interchangeable cutters (90° or 120°) for square or radius corners. Saves time and spoilage. No need to remove door. Made of heat treated aluminum.

FORMED COPPER STRAINERS
For sealed and open unit installations. Can be used with capillary tubes or on liquid lines. Hard drawn copper shell. 120 mesh metal screens.

FLAPPERS FOR SEALED UNITS
Made of the finest Swedish spring steel. Suction and discharge flappers, valves and retainers for Westinghouse, Stewart Warner, Philco, Tecumseh, G.E., Kenge, Frigidaire, Crosley, Coldspot, Gibson and Kelvinator, etc.

COMPRESSOR GASKETS FOR SEALED UNITS
Precision die cut sheet asbestos. Uniform thickness to insure original efficiency. For Crosley, Gibson, Kelvinator, Servel, Tecumseh, Philco, etc.

HEP-THE MIRACLE SOLVENT
Quickly and easily cuts through sludge and gum carbon to loosen metal gleaming new. Harmless to skin, non toxic, non-inflammable. Easy to use. Just mix with water. Can be used over and over. Saves hours of sanding, scraping and lapping.

LINE TAP VALVE
Small, compact hermetic valve. Easily installed on lines. Pierces tube without discharging refrigerant, providing a port for testing, charging and discharging. Conforms to tube. Will not loosen or develop leaks due to vibration. Use with Watsco control valve.

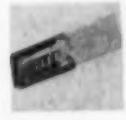
CAN TAP VALVE
Screws on Charg-A-Can refrigerant dispensing containers. Valve stem needle pierces the can seal and operates as a regular valve allowing removal of refrigerant. Easily shut off and sealed. No large protruding parts when in closed position. Use with Watsco control valve.

LINE PORT VALVE with T-S CONNECTION
Reduces inventory. Provides a port for sealed units where cutting line to be tapped. No big brazed assembly to vibrate loose. Versatile T-S Connections permit large numbers of combination possibilities. Use with Watsco control valve.

CONTROL VALVE
For use with Line Tap, Line Port and Can Tap Valves. Easily opens or closes valves. Installed without wrenches. Use over and over. One tool for hundreds of jobs.

2 WAY SHUT OFF VALVE
With the new T-S connection. Large number of possible installation combinations with T-S connection. Reduces inventory to a fraction. Connects by either or both flare connections and solder connections.

2 WAY CHECK VALVES
For reverse cycle systems. Change in cycle from cooling to heating or heating to cooling causes check disc to close against an opposite seat permitting new direction of flow. Used in G.E. Weathertron unit.

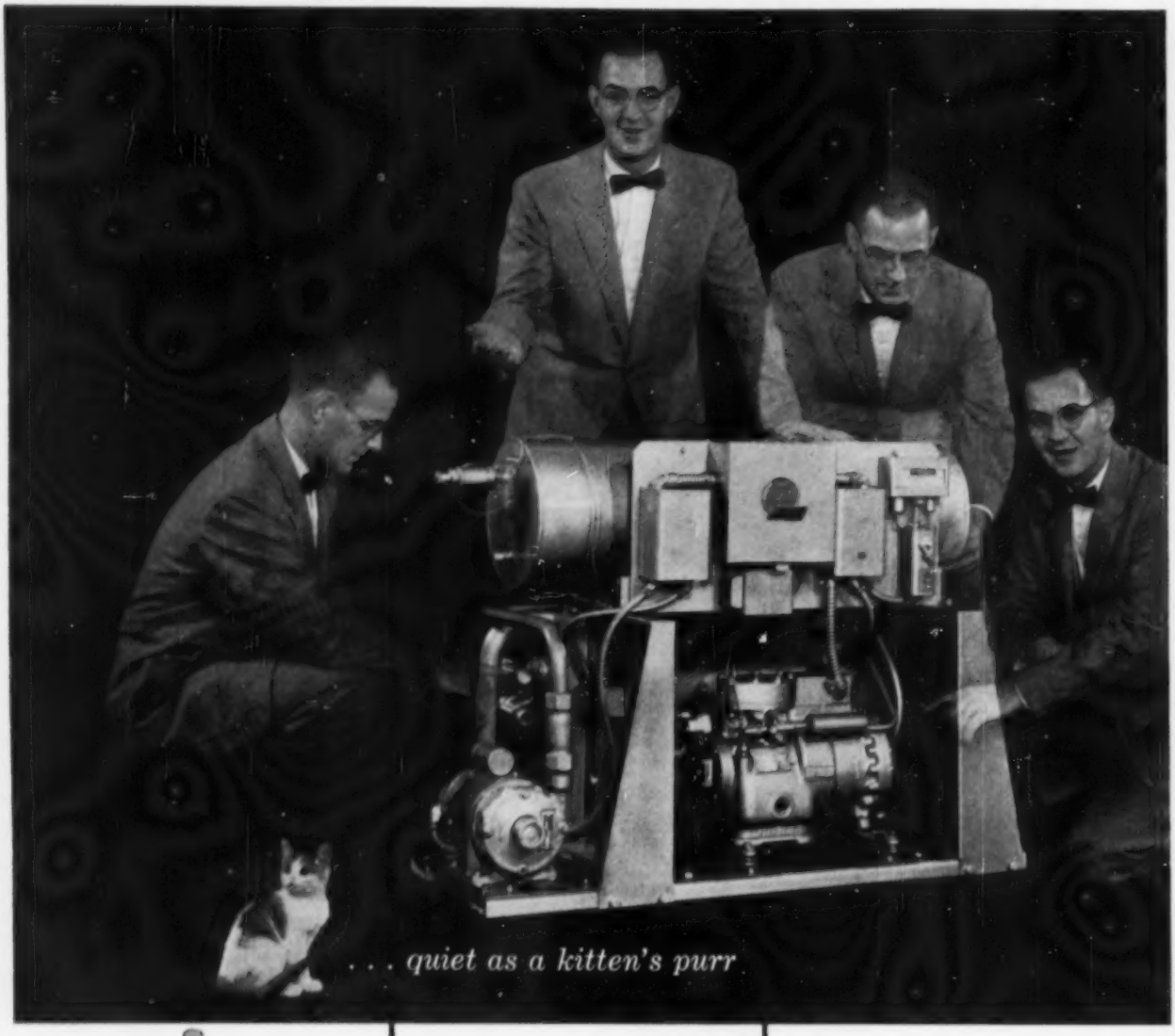


10 PIECE SOCKET SET
Small, heavy duty. Made of heavy plated tempered alloy steel. Reversible ratchet wrench with extension bar and 8 sockets. Sizes from 3/16" to 7/16". Complete with transparent covered steel case.

SEND FOR WATSCO'S CATALOG!

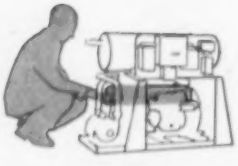
WATSCO WAGNER TOOL & SUPPLY CORP., 40-08 22nd St., L. I. C., N. Y.

Circle No. 63 on Reader Service Card



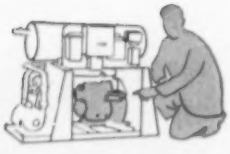
The Acme DRY EX®— recognized leader in the chiller field

Dry-Ex design puts extra chilling capacity in every inch of chiller space. Dry-Ex tubes are electronically rolled into the tube sheet openings — no internal joints, no trouble on the job!



Model S Acme Condenser — maximum heat transfer, minimum size

Acme's integral fin tubing and compact coil design puts extra heat transfer capacity in a size of condenser that adds to Flow-Cold's compactness.



Advanced design Acme Compressor — precision-built for quiet, dependable operation

New, accessible hermetic-type compressor has aluminum pistons —is dynamically and statically balanced for quiet, vibration-free performance.

A product of Acme Industries, Inc.—Manufacturers of Quality Air Conditioning and

Circle No. 64 on Reader Service Card

Acme's new FLOW-COLD

today's most advanced packaged chiller in the 3 thru 20-ton range

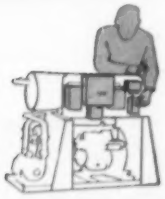
Acme's research and development men have done it again: Significant improvements in design and better-than-ever quality have been built into the new Flow-Cold to make it today's most advanced small-tonnage packaged liquid chiller. No new position, this — since introduced in 1950, the Flow-Cold has been the industry's most widely used packaged chiller.

BALANCED, PROVEN COMPONENTS. Acme takes components that are individually tops in their fields, selects the exact capacities needed for real efficiency and economical operation, and assembles them in a compact package. That's the Flow-Cold — you can't buy better!

EVERY FLOW-COLD FACTORY TESTED. Every Acme Flow-Cold unit is fully charged, tested and operated under actual load conditions before shipment.

SIMPLE TO INSTALL AND OPERATE. With over 36 years of Acme field experience to draw from, Flow-Cold engineers design these packages with the contractor and use in mind. Fast, easy connections — trouble-free operation!

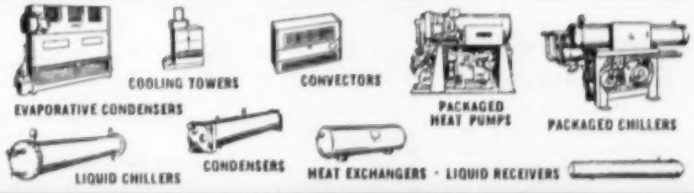
For packaged chiller capacities from 20 thru 300 tons, investigate the versatile Acme Flow-Therm. Standard or custom packages to fit your needs.



Accurate controls match unit operation to the load

All necessary controls are furnished to give fast, accurate response to system requirements. Compressor operates only when needed: power consumption and wear are minimized.

Refrigeration Equipment since 1919



ACME INDUSTRIES, INC. JACKSON, MICHIGAN

ACME AIR CONDITIONING REFRIGERATION

Get the facts on FLOW COLD— Send the coupon today.

Send me the complete new catalog on Flow-Cold packaged liquid chillers.

Name..... Title.....

Address.....

City..... Zone.....

State.....

Circle No. 64 on Reader Service Card

cooling coil, thermostatic valve, centrifugal blower and motor. Units can be quickly and easily installed in any out-of-the-way place from basement to attic. An "XD Meter-Miser" compressor of suitable size furnishes refrigeration, and can be installed away from unit if necessary. The new system is adaptable for use with city water, tower water, evaporative, or air cooled condensing units.
Circle No. 163 on Reader Service Card

Unit Heaters

Product: Large capacity, gas-fired unit heaters with permanent, split capacitor motors.

Manufacturer: Janitrol Div., Surface Combustion Corp., Toledo, Ohio.

Features: Greater operation dependability and lower maintenance cost are expected to result from use of permanent split capacitor motors now offered on company's heaters of 175,000 to 225,000 Btu capacity. New design eliminates starting mechanism required for conventional split phase motors. Failure of this mechanism was a major cause of service calls, which Janitrol engineers predict will be reduced as much as 90% through use of the new motor. All motors are equipped with built-in thermal overload protection, and normal variations in electrical current voltage will not adversely affect motor speed, with result that volume of air delivery remains constant. Increased motor efficiency is also expected to produce significant savings in electrical current consumption.
Circle No. 164 on Reader Service Card

Window Conditioner

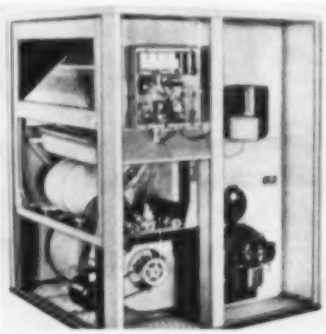
Product: Custom window air conditioner with push button controls.

Manufacturer: Gibson Refrigerator Co., Greenville, Mich.

Features: Unit is equipped with infinite control direction louver for no-draft circulation, permanent type electro-static dust magnet filter, and "Gib-Sun-Air" ozone lamp that purifies air and removes stale odors. Thermostatic temperature control is also provided. Unit is available in ¾, 1, and 2 hp models which may be mounted flush with drapery line. Finish is baffin beige with gold trim.
Circle No. 165 on Reader Service Card

Year 'Round Unit

Product: "Luxaire" combination heating and cooling system.



Manufacturer: C. A. Olsen Mfg. Co., Elyria, Ohio.

Features: Unit incorporates 5 ton capacity cooling system and 175,000 Btu input heating system in the

Let's look inside!

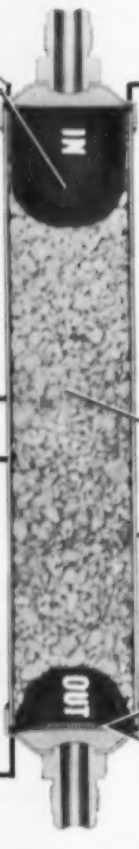
See why a DFN FILTER DRIER is your best buy!

INLET FILTRATION
(not just screens)

Large filter area—proportioned to the capacity of the drier.

Filter media of sufficient depth and density to properly filter down in the micron range.

Inlet filtration keeps desiccant from acting as a filter at reduced drying efficiency and capacity.



PROCESSED GRANULAR DESICCANTS

Free of contamination—fully efficient—full capacity.

Maximum effective surface area per cu. in. of desiccant.

Quantity of desiccant based on amount of refrigerant in system.

Quality of desiccant assured by processing and packing under laboratory control.

OUTLET FILTRATION
(not just screens)

Depth micron filtration of proper density holds all fines and foreign matter within the drier.

Positive protection of expansion valve and other parts of the system.

All Brass Construction

All fittings made to industry standards

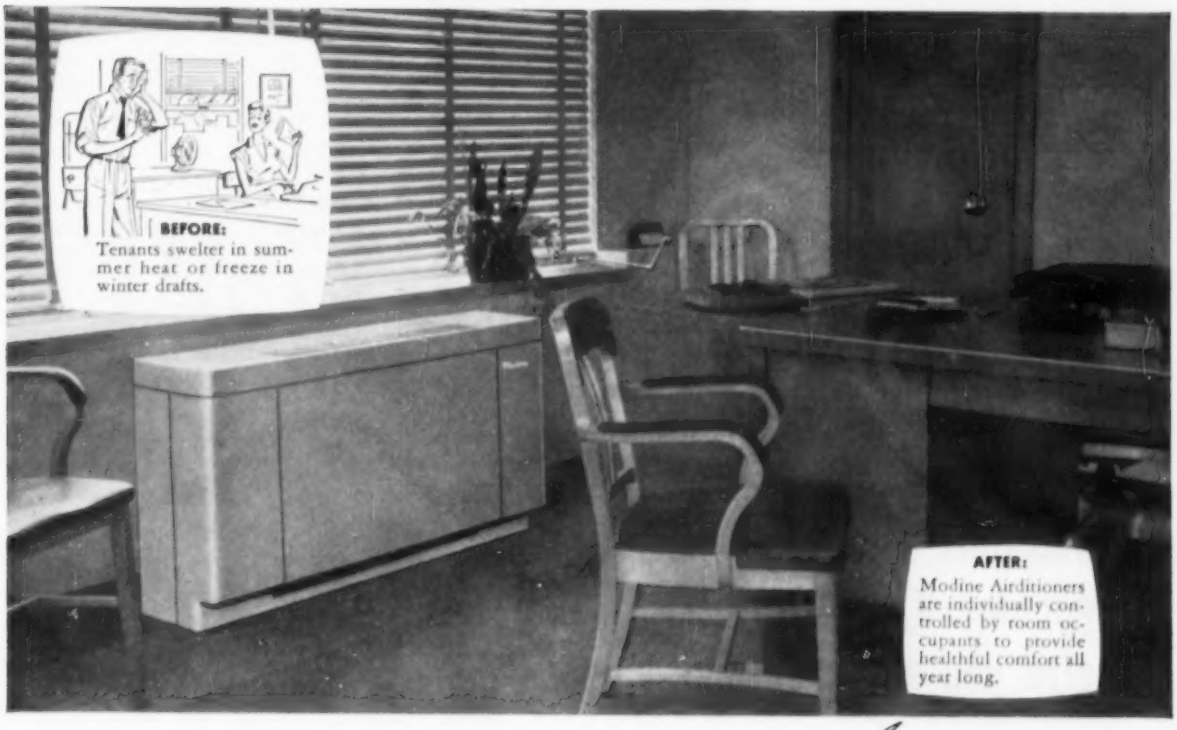
Outlet safety screen

Complete range of sizes and types at leading wholesalers everywhere. Ask for DFN—first in drying, the world over.

DFN
Since 1925
The McIntire Company, Livingston, N. J.
DRIERS • FILTERS • STRAINERS

Circle No. 65 on Reader Service Card

Air conditioning existing buildings may be easier than you think...


BEFORE:
Tenants swelter in summer heat or freeze in winter drafts.
AFTER:
Modine Airditioners are individually controlled by room occupants to provide healthful comfort all year long.

It's as simple as this, with Modine Airditioners*

1. Individual units replace radiators in each room to be air conditioned. Hot water from your present boiler is piped to each unit for heating. Cold water from a central chiller is supplied through the same piping for summer cooling. A small motor (1/30 to 1/12 hp) operates two quiet fans in each AIRditioner to provide refreshingly cooled or heated air circulation. There are no expensive ducts to install. Here is low-cost, year-round comfort for new or existing office and apartment buildings, hotels or motels, hospitals or homes.

2. Operating flexibility cuts costs. With Modine AIRditioners, room occupants control their own temperatures. Units are opesated only when and where they are needed. No need to air condition an entire building to provide comfort only in occupied rooms.

3. Types and sizes for every application. AIRditioners are offered in console (illustrated), concealed, built-in overhead and exposed ceiling models . . . in sizes to meet your remodeling or new construction requirements. All units are furnished with quiet, slow-speed motors (1050 rpm top speed) having built-in thermal overload protection as a standard safety feature.

*Trademark

Want to know more?

Consult the classified section of the phone book for your Modine representative. Contact him or mail the handy coupon for illustrated booklet.

MODINE MFG. CO.
1584 DeKoven Avenue, Racine, Wisconsin

Gentlemen: Please send me a free copy of Bulletin 745-D, describing Modine AIRditioners.

Name .....
Firm .....
Address .....
City ..... Zone ..... State .....

A-1283

Circle No. 66 on Reader Service Card

same cabinet. Cooling system is charged and hermetically sealed at the factory. It is comprised of a 5-hp, gas cooled, hermetic compressor; capillary tube metering device; extra-large area, fin-on-staggered-tube cooling coil; water cooled, shell and fin tube compressor; and a modulating, automatic water control valve. Unit can be fired for heating with either gas or oil. Cabinet dimensions are 51" wide, 50" deep and 68" high.
Circle No. 166 on Reader Service Card

BUY FROM YOUR REFRIGERATION WHOLESALER

Spray Nozzle

Product: "Cant-Clog" self-cleaning spray nozzle for central system air conditioners.

Manufacturer: Carrier Corp., Syracuse, N. Y.

Features: Nozzle is equipped with a special flexible orifice which "spits out" particles that would block conventional types of nozzles. If foreign matter collects behind the diaphragm, built-up water pressure forces it to stretch, enlarging the opening and expelling particles. Nozzles for medium pressures are made in two sizes with a low pressure cap also available for the smaller model. Unit is easily installed, and available in conventional sizes to replace existing nozzles in a wide variety of air conditioning equipment.
Circle No. 167 on Reader Service Card

Genuine VIBRA-SORBERS® are made only by FLEXONICS

and only genuine VIBRA-SORBERS® give you all these plus values—

● The best way to be sure of your vibration connections to and from the compressor is to be sure that the connections are made with genuine VIBRA-SORBERS. And it is not a genuine VIBRA-SORBER unless it is made by Flexonics Corporation.

In addition to the advantages listed at the right, genuine VIBRA-SORBERS feature a special corrugation formation combined with a balanced bronze braid designed to provide maximum resistance to fatigue and the maximum in vibration and noise absorption.

Don't be misled, be sure you get genuine VIBRA-SORBERS. Available in all standard sizes from ⅛" through 4" I.D. Bulletin 139 gives full VIBRA-SORBERS specifications. Write for your copy.

√ **HIGH QUALITY SPECIAL BRONZE ALLOY**—98.75% copper, 1.25% tin, assures maximum resistance to fatigue under constant flexing and vibration.

√ **LISTING BY UNDERWRITERS' LABORATORIES** in sizes 3/16" through 1½".

√ **HIGHEST CLEANLINESS STANDARDS** prevent foreign matter being brought into system. Vibra-Sorbers delivered to you with ends sealed.

√ **APPROVED BY MAJOR MANUFACTURERS**—the standard of the industry as original equipment.

√ **NEATLY PACKAGED AND LABELED** for easy, convenient stocking.

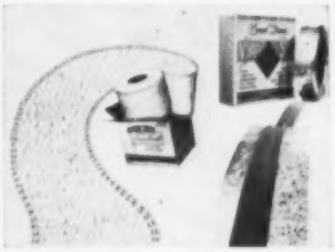
Flexonics Corporation
CHICAGO METAL HOSE DIVISION
1321 S. THIRD AVENUE • MAYWOOD, ILLINOIS
FORMERLY CHICAGO METAL HOSE CORPORATION
Flexon identifies products of Flexonics Corporation that have served industry for over 53 years.
Manufacturers of flexible metal hose and conduit, expansion joints, metallic bellows and assemblies of these components.
In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario
Circle No. 67 on Reader Service Card

Flexible Duct Connections

Product: New lengths and gauges of flexible duct connectors.

Manufacturer: Grant Wilson Inc., Chicago, Ill.

Features: "Vibra-Stop" and "Flexi-Duct" connectors are now available in 25, 50, and 100′ rolls,



and "Vibra-Stop" is being fabricated with either 24 or 26-gauge galvanized metal. "Flexi-Duct" is a woven asbestos flexible tape and "Vibra-Stop" is produced by sandwiching a length of either asbestos or canvas between two lengths of galvanized metal. Both are used in heating, ventilating, and air conditioning applications for stopping system noise and allowing greater tolerance in length of duct and duct alignment. Rolls of material are individually packaged in easy-to-handle cartons.
Circle No. 168 on Reader Service Card

Freon Condensers

Product: Line of new "Co-Axial" Freon condensers.

Manufacturer: Edwards Engineering Corp., Pompton Plains, N. J.

Features: Units are fabricated of an inner tube having longitudinal fins, spirally wrapped and solder bonded, encased by an outer tube serving as the shell. Construction is designed to reduce costs, water need, shipping weight, and to conserve space. Available in sizes of from 1 to 7½ tons.
Circle No. 169 on Reader Service Card

BUY FROM YOUR REFRIGERATION WHOLESALER

Do you know the sales and profit facts about usAIRco Distributorships?

Find out how young, growing, cooperative management will give you a "two-sided partnership"!

If you are thinking of going into air conditioning, or dissatisfied with your present source . . . it will pay to get the facts about a usAIRco distributorship

The only distributor program built with *you* in mind, assures flexibility to meet local conditions . . . gives a closeness of cooperation from the factory you will find nowhere else!

usAIRco manufactures a *complete* line of air conditioning equipment for every type of job. Over 30 years' progress in this field guarantees unsurpassed quality . . . makes possible our liberal 5-year warranty and service allowance.

Inventory problems are eliminated through usAIRco's Warehouse Plan and Finance Plan, which make merchandise available *when you need it*, without tying up capital. Aggressive advertising and dealer aid program helps you to keep the sales ball rolling.

Write today for complete details!

UNITED STATES AIR CONDITIONING CORPORATION

MINNEAPOLIS 14, MINNESOTA

usAIRco

John C. Craig, Manager, Packaged Refrigeration Division
United States Air Conditioning Corporation
Minneapolis 14, Minnesota

I would like the complete story on the usAIRco distributor plan.

Name of Company_____

Address_____

City_____ State_____

By_____

Circle No. 68 on Reader Service Card

Calendar of Industry Conventions

Jan. 22-26	Natl. Assn. of Home Builders (Meetings and Builders' Show)	Chicago, Ill. Conrad Hilton Hotel
Jan. 23-25	American Society of Heating & Air Conditioning Engineers	Cincinnati, Ohio
March 12-16	Natl. Electrical Mfgs. Assoc.	Chicago, Ill. Edgewater Beach Hotel
March 18-21	American Society of Mechanical Engineers (Spring Meeting)	Portland, Ore. Multnomah Hotel
April 19-21	Gas Appliance Mfgs. Assoc.	White Sulphur Springs, W. Va. The Greenbrier
May 7-9	Air-Conditioning and Refrigeration Institute	Hot Springs, Va. The Homestead
June 3-6	American Society of Refrigerating Engineers	Cincinnati, Ohio
June 11-15	21st National Oil Heat and Air Conditioning Exposition	New York City Coliseum
June 17-21	American Society of Mechanical Engineers (Semi-Annual Meeting)	Cleveland, Ohio Hotel Statler
June 18-20	American Society of Heating and Air Conditioning Engineers (Semi-Annual Meeting)	Washington, D. C.

CHRISTMAS PLAN BUILDS ROOM COOLER SALES

A three-point sales plan of Mitchell Mfg. Co. for merchandising room air conditioners during the Christmas season has met with great success. More than 650 appliance dealers ventured into so-called "off-season" selling of Mitchell units.

The company's plan was based on these three major points: (1) Mitchell guaranteed dealers purchasing units before Dec. 31, 1955, a rebate of 30% on as many as 1/3 of the units that remain unsold after July 27, 1956; (2) the company offers to pay to dealers a rental of up to $18 for 6 sq. ft. of display space in their stores for the merchandising of Mitchell units; (3) consumers were offered a Christmas purchase plan under which they could make a down payment on a room air conditioner to be installed in early spring, and at the same time receive a "bonus" in the form of two pieces of electric cooking equipment.

John Romadka, president, outlined a 10-point program which includes expanded national advertising to the ultimate user, an augmented direct-mail program, a detailed selling program teaming the distributor and the factory field man in a joint effort, a planned program of local publicity, and exclusive deals resulting from inquiries to the company within protected distributor territory.

FEDERAL FRANCHISES OFFERED AT SHOW

Federal Refrigerator Mfg. Co. announced during the ARI Show that as part of its expansion program for 1956 it has several exclusive franchises available for distributors who can qualify.

NEW FIRM TO PRODUCE WILSON HAIR FILTERS

Technical Filter Co., Chicago, Ill., has recently been formed to continue the manufacture of Edgeseal and Honeycomb hair filters. The filters had formerly been produced by the Hair Products Div., Wilson & Co. until their manufacture was discontinued a few months ago. The new firm is headed by Ray E. Cooper, who has been with the Wilson concern for the past nineteen years.

GOOD GUESSING PAYS OFF AT ARI SHOW

Good guessing paid off for Rudolph H. Lambert, chief development engineer for White-Rodgers Electric Co., at the recent ARI exposition in Atlantic City.

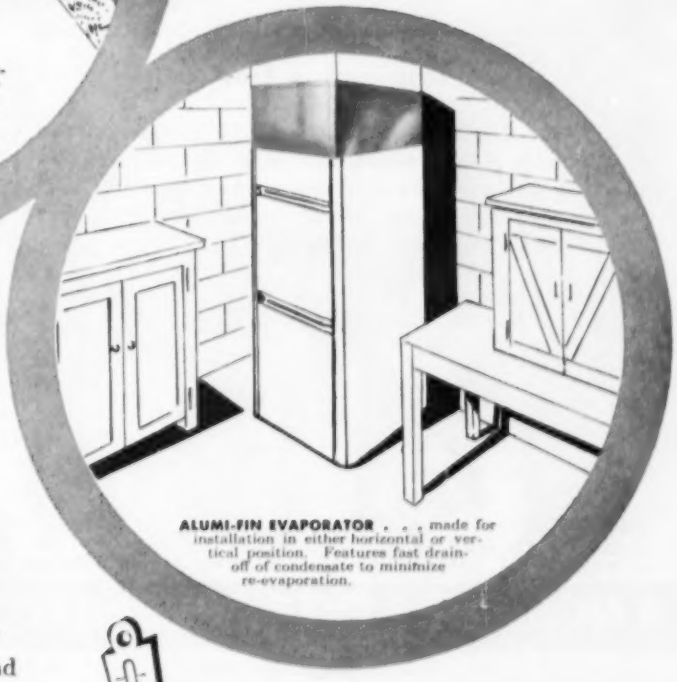
One of the features of the exhibit by Wolverine Tube, Div. of Calumet & Hecla, was a mock-up of an old-fashioned icebox containing an actual block of ice. Visitors were asked to make a "guesstimate" as to when the ice would melt.

The ice completely melted at 2:35 p.m. on Thursday, Dec. 1. Lambert guessed the melting time exactly, and as the winner received a ¾-ton air conditioner of his choice.

HOW MUCH TUBING was contained in a roll on display was the contest center in the Viking Copper Tube Co. exhibit at the ARI Show. Actual amount in the roll was 5060 feet, and the winner, Martin Vidis of Ranco, Inc., came within 7 inches of being right on the button with an estimate of 5059 feet, 5 inches. His reward was a Mitchell Hi-Fi unit, and accepting it for him here from "Miss Viking Copper Tubing" is Ed Graff, former sales manager of Ranco, who came out of "retirement" to attend the Show.

Air-Cooled Summer Conditioner by Janitrol

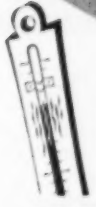
EXCLUSIVE NEW TOP-EXHAUST COMPRESSOR-CONDENSER . . . cools more efficiently, protects shrubs and flowers from "drying out" action of exhaust air. Circulates cooler ground air over condenser, exhausts it at top, not sides as in ordinary units! Smartly-styled, a beauty in any yard.



ALUMI-FIN EVAPORATOR . . . made for installation in either horizontal or vertical position. Features fast drain-off of condensate to minimize re-evaporation.

Something New In Remote Condenser Units!

It's compact, quiet, quality-engineered and built to do away with callbacks, complaints and service headaches! Uses no floor space—cooling evaporator section mounts in duct; compressor-condenser section goes outside. Needs only air and electricity for operation. Ask your Janitrol representative to tell you more about it, or mail the coupon to us *right away.*



AMAZING COOLING EFFICIENCY!
Delivers cool, refreshing air even with outside air temperatures up to 125 F.° Available 2, 3 and 5 ton capacity models.

JOIN THE PROFITMAKERS . . . JOIN THE JANITROL DEALER FAMILY!
Cash in on Janitrol's Complete Line of Air-Cooled and Water-Cooled Summer and Year 'Round Conditioners!

NOW—CALL YOUR JANITROL REPRESENTATIVE, or mail coupon to us for full Air-Cooled Conditioner Details!

Janitrol Heating and Air Conditioning Division
Surface Combustion Corporation
Columbus 16, Ohio

I'd like to join the Janitrol Profitmakers! Rush details on all-new Janitrol Air-Cooled Conditioner, Model SRA.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Janitrol
HEATING AND AIR-CONDITIONING DIVISION

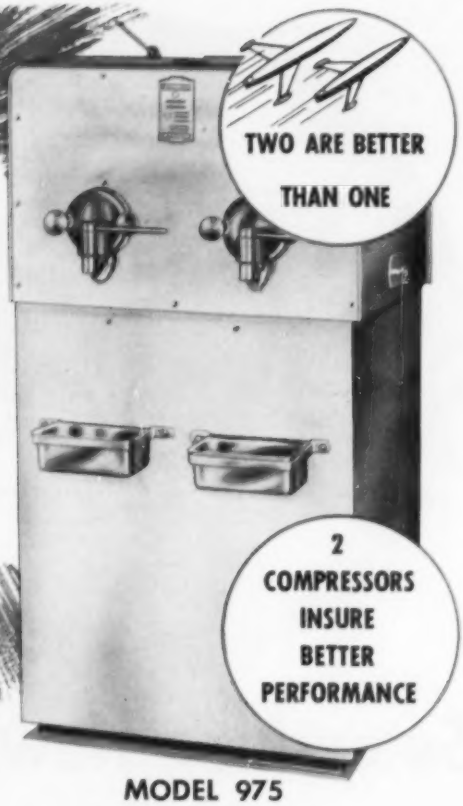
Surface Combustion Corporation, Columbus 16, Ohio
In Canada: Moffat Heating and Air Conditioning Division of Moffat's, Ltd., Toronto 15.

Circle No. 69 on Reader Service Card

for '56 FREEZ-KING ANNOUNCES

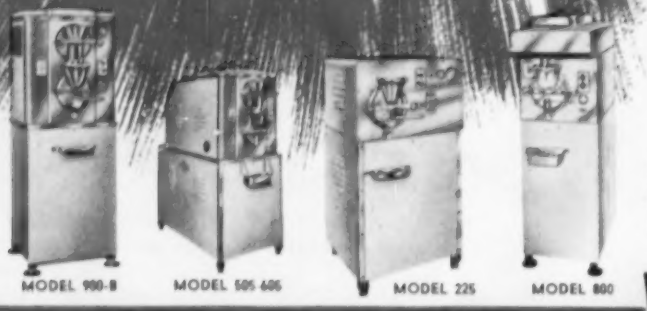
the greatest development in modern continuous freezers!

the new FREEZ-KING—easiest to operate and most sanitary twin freezer in the world. Two complete freezers in one stand—each unit operates independently—every portion perfect—exclusive, new FREEZ-KING automatic feed.



MODEL 975
SELF CONTAINED

Spigot type draw-off produces neat, uniform products. All stainless steel. Large output capacity.



A MODEL FOR EVERY PURPOSE

ORDER YOUR FLOOR SAMPLES *TODAY!*

MODEL 160
SHAKE DISPENSER
serves
200 SHAKES AN HOUR

- Easy! As simple as serving a soft drink.
- Produces shakes and malts at low cost—high speed—big profits.
- Sanitary! Direct from dispenser to customer. No handling. No contamination.

MODEL 150
serves
SOFT ICE CREAM or FROZEN CUSTARD

- Uses less power—costs less to operate.
- Requires only four square feet of floor space.
- Easy to clean! Takes only 5 to 10 minutes instead of the usual ¾ to 1½ hours.

2 LOW PRICED MODELS FOR

Lunchrooms	Burger Stands	Amusement Centers
Drive-ins	Drug Stores	Military Canteens
Supermarts	Bus Stations	Grocery Stores
Theaters	Skating Rinks	Industrial Cafeterias

. . . and many others

EXCLUSIVE TERRITORIES AVAILABLE FOR MASTER DISTRIBUTORS & DEALERS

WRITE FOR DETAILS

THE FREEZ-KING CORPORATION

2518 WEST MONTROSE AVE., DEPT. 10, CHICAGO 18, ILL.

Circle No. 31 on Reader Service Card

ONLY 1 HOME IN 22 IS AIR CONDITIONED, DU PONT STUDY SHOWS

Only one home in 22 is equipped with mechanical air conditioning at the present time, the Du Pont Co. says in reporting initial findings of its first annual survey of the home cooling market.

The company also reported that of the people surveyed, only 8.2% had ever been solicited to buy air conditioning, either by salesman or by mail. This surprisingly small "penetration" of the estimated 45 million dwelling units might well mean that more room air conditioners are being installed for commercial applications than had been thought.

Only 4.3% of 13,441 householders personally interviewed in a nation-wide "scientific probability" sample of metropolitan and urban residents said they owned a room air conditioner. Another two-tenths of 1% said their homes were mechanically cooled by central air conditioning systems, while an additional 6.2% indicated they were beating heat and humidity with evaporative coolers and similar non-refrigeration systems.

89% of Homes Uncooled

That leaves 89.3% of the nation's homes without some form of mechanical cooling at the present time and represents a virtually untapped market for the air conditioning industry, Robert J. Thompson, director of sales for Du Pont's "Kinetic" Chemicals Div., said.

42% of the owners of air conditioners said they worked in air conditioned establishments. In 56% of the cases surveyed, the man did the buying of the unit.

Significant is the fact brought out in the survey that 5.9% of those interviewed said they specifically intended to buy air conditioning. Compared with the present estimated 4.3% who now own air conditioning equipment, this shows a relatively huge buying interest.

Asked why they bought a certain make, 38% said price was the influencing factor; 34.9% said they bought on dealer or brand reputation; only 10% said a salesman "sold" them on one brand.

Too much noise was the complaint of 12.7% of present owners surveyed; 25.8% they didn't get as much cooling as expected.

These are only preliminary analyses of the survey. It is expected that detailed analysis will turn up much additional marketing and merchandising information. The survey was made for Du Pont by W. R. Simmons & Associates.

About half the owners of room units said they had bought their cooling units during the hottest part of the summer while 28% attributed their purchases to health reasons. 5% said they bought home units because they "got used to it" at their places of employment or in friends' homes.

Coolness topped the list of things owners said they liked best about their room air conditioners, with 40% mentioning that feature. Another 22% said they could sleep much better, while 9% mentioned humidity control features and 8% said the units helped provide a dust-free room, with reduction in cleaning chores.

Just a fraction under half of the units were installed in bedrooms, while 34% were installed in living rooms.

Renters accounted for only 23.7% of the total cooling unit owners. Three-quarter ton units led all other sizes of room air conditioners, accounting for 47% of the total reported.

Ownership of room cooling units was greatest among owners or renters of homes in the $10-$15,000 class, which accounted for 30%. Another 44% of the units owned were divided equally between homes in the $7500-$10,000 and $15-$20,000 ranges.

Among non-owners of room air conditioners, the most frequently mentioned deterrents to purchase were price, cost of adequate wiring, high cost of operation, and, in the case of renters, landlord regulations against installation.

HANGING HIGH is this 25-hp Unarco air conditioning unit, which with another 20-hp unit is suspended from the roof of the new Woolworth store in the Wallace Town shopping center now being completed in Chicago Heights, Ill. The two units have a combined weight of 7500 lbs. By suspending the equipment, an additional 60 sq. ft. of floor space was saved. Steel "I" beams were tied in to the roof trusses for platforms on which the units are mounted. Inspecting the 25-hp unit here are Charles L. Schrager, owner and developer of the shopping center, and Peter B. Colwin, assistant general sales manager of Unarco's Heating and Cooling Div.

JOBBER SALES DIV. FORMED BY HAGAN

A new jobber sales division has been formed by Hagan Corp. to handle marketing of Calgon products sold through distributor outlets for air conditioning, plumbing and laundry supplies. The new division combines the present activities of the Micromet and laundry departments, and is headed by C. L. Barksdale.

WARRANTY PROCEDURE CHANGED BY SERVEL

A new procedure for use by service companies, dealers and contractors in obtaining replacement power units, compressors or parts on "in-warranty" condensing units has been announced by Servel, Inc., effective Dec. 15.

Under the new procedure, the parts supplier cannot make an over-the-counter "no charge" replacement. On inoperative power units or compressors brought to the parts supplier at the time of exchange, the published exchange price will be charged. If the replacement is received prior to the return of the inoperative part, the straight sale deposit price will be charged.

Credit will be issued to the service company or dealer after the inoperative power unit, compressor or part has been received and inspected at the Servel factory. On "in warranty" units found defective due to material or workmanship, full credit, plus freight to and from the parts supplier will be allowed. If the unit is found to be out of warranty and failure is due to abuse or misuse, a credit less the exchange price will be issued.

The dealer or service firm is required to have the complete model and serial number of the condensing unit and the part number and serial number of the power unit or compressor brought in for replacement.

All questions as to charges, it is emphasized, should be referred to Servel, since the parts supplier has no alternative but to abide by the factory's decision.

A perfect team in my book—
YORK Valves and Fittings and
the YORK WHOLESALER of
Accessories and Supplies!

I want satisfied customers -- and York Valves and Fittings really help me get them!

1. Every York Valve is triple inspected and double tested under water at 300 lbs. pressure.
2. I know of York Valves that have been in use for 50 years!
3. York makes the industry's most complete line.

I want SERVICE when I need it!

1. York Valves and Fittings are immediately available from my York Authorized Jobber.
2. He knows his business, and I rely on him for a lot of helpful tips.
3. Take my advice and get in touch with your York Authorized Jobber -- right away.
4. He's an expert.

MR. WHOLESALER—INVESTIGATE THE ADVANTAGES OF THE YORK LINE!

IT ALWAYS PAYS TO USE YORK ACCESSORIES AND SUPPLIES

Air Filters • Automatic Controls • Charging Connections • Coils and Piping • Cold Storage Doors • Freon Refrigerants • Gas Masks • Hand Oil Pumps • Ice Cans • Motors and Pumps • Oil • Oil Traps • Purge Devices • Receivers • Renewal Parts • Suction Traps • System Cleaners • Valves and Fittings.

York refrigeration air conditioning

accessories and supplies by york

YORK CORPORATION YORK, PENNSYLVANIA

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

Circle No. 80 on Reader Service Card

PENGUIN SALES AND FREEZ-RITE MERGE

Bailey & Perkins Co., Freez-Rite Div., Utica, Mich., and Penguin Sales Div., Worden Specialty & Machine Co., Inc., Plymouth, Mich., have announced that they are merging under the name of Freez-Rite (a Division of Worden Specialty & Machine Co.) Manufacturing operations will be carried on at Plymouth.

Freez-Rite is a partnership, with Clare Perkins as general manager and C. D. Young as director of sales.

ISOTRON REFRIGERANTS ANNOUNCED BY PENNSALT

Pennsylvania Salt Mfg. Co. has announced plans to enter the erosol propellant and refrigerant fields late in 1956 with the "Isotron" line, a complete family of chlorofluorohydrocarbons. The new products will be produced in a new plant already under construction at Calvert City, Ky.

Initial products in the line, the company reports, will include trichloromonofluoromethane, dichlorodifluoromethane, and monochlorodifluoromethane. Early additions to the line will be trichlorofluoroethane and dichlorotetrafluoroethane.

SQUARE D, ELECTRIC CONTROLLER TO MERGE

Square D Co., Detroit, and Electric Controller & Mfg. Co., Cleveland, have called special shareholders' meetings to vote on merging the two companies. Directors have approved the plans.

Plastic Pipe Makes Possible A "Take-Apart" Skating Rink

AN 85 x 185′ outdoor ice skating rink that can be quickly disassembled in warm weather to permit use of the site for other recreational purposes has been installed in Wilmington, Del., for use between the months of November and April. Barring weather delays, the entire rink can be installed and placed in operation in about six days, with dismantling time possibly a little shorter.

This special advantage is attained by the use of more than 8½ miles of flexible plastic piping made from DuPont "Alathon" polyethylene resin, providing a network of brine coils over which water is sprayed and frozen to provide a 2 to 3″-thick skating surface. Three electrically driven 30-ton Chrysler Airtemp compressors, equipped with Freon-22 and mounted on trailer trucks, are used to pump 15 F brine throughout the system.

Pipe Grid Covered With Sawdust

Installation of the outdoor rink involved laying down a framework of 2 x 4 timbers, or "sleepers" on a leveled section of a baseball diamond and installing 4″ brine supply and discharge pipes at each end of the rink. One-inch pipe outlets were welded into this pipe at 4″ intervals, and 185′ lengths of the plastic piping were coupled with screw clamps between each outlet on the supply pipe and an inlet on the return system at the opposite end of the rink. The long lengths of polyethylene pipe were clamped on 4″ centers on each of the "sleeper" timbers.

After installation of a 3′ high dasher rail around the perimeter of the rink, the entire area was covered with about 3″ of sawdust, which was leveled off at the top surface of the network of plastic piping. With 15 F brine circulating through the system, water was then slowly sprayed over the piping until a 2 to 3″ coating of ice was built up over the entire rink area to provide an adequate skating surface.

Why Plastic Piping Was Used

Plastic piping was particularly useful in this instance because of its light weight, resistance to corrosion from brine, and availability in rolls of any length permitted assembly of unusually long runs without the need of joints.

Installation engineers said the system should provide good skating until the outdoor temperature reaches the upper 60's.

The Wilmington rink has been installed as an experiment by Recreation Promotion and Service, Inc., a non-profit organization established by a group of community-minded people interested in promoting recreational facilities.

NEW

Anemotherm Air Meter

gives you all vital readings with

PUSHBUTTON

ease

The Model 60 Anemotherm Air Meter, developed by the Anemostat Corporation of America, gives you—*in one convenient instrument*—a simple, rapid method of balancing and checking any air system. It puts at your fingertips, by means of *color-coded pushbuttons*—

Air Velocity

Measures air velocities from 10 to 8,000 fpm, in increments as small as 5 fpm—a wider velocity range than ever offered before. It is essentially non-directional.

Air Temperature

Provides rapid-response measurement of temperatures from 0 to 255F. Temperatures can be read with an accuracy of one-half of one degree.

Static Pressure

Measures static pressures directly in terms of inches of water, from 0″ to 10″ wg. positive or negative, with a sensitivity of better than .05″ at lower range.

The new Anemotherm Air Meter saves time and money. Write for Bulletin 55 giving all essential data.

AC 1256

ANEMOSTAT CORPORATION OF AMERICA
10 EAST 39th STREET, NEW YORK 16, N. Y.
MANUFACTURERS OF
ANEMOSTAT DRAFTLESS *Aspirating* AIR DIFFUSERS

Circle No. 71 on Reader Service Card

Quick installation, quick profit...

Ranco's new control for ice bank milk coolers gives you both

Here's a new control that fits right the first time . . . and offers better ice bank regulation than any other milk cooler control on the market.

Location of the control bulb determines the size of the ice bank. Control has 72" capillary tube, 5/16" diameter bulb, and a strip clamp. Single-pole, single-throw switch opens on temperature drop at 32°F, recloses at temperatures slightly over 32°. Other Ranco milk cooler controls simplify your replacement job, too. Models 010-1477, 010-1414 and 010-1829 are efficiently adaptable to either waterspray or ice bank coolers, can be installed quickly.

Ranco Replacement Reference No. 1544

describes nearly 5,000 additional Ranco refrigeration and air conditioning controls—each tailored to a specific job. Purchase your copy from your Ranco wholesaler today (not available from the factory).

Exact replacement
018-100 Ice Bank Control

RANCO CONTROLS

Ranco Inc.

COLUMBUS 1, OHIO

World's Largest Manufacturer of Refrigeration Controls

Circle No. 72 on Reader Service Card

HERE'S HOW!

How Do You Stack Up With Mr. Average Serviceman?

An interesting composite picture of the professional domestic refrigerator serviceman has been revealed by Albert E. Manning, vice president of a large service contracting firm and an international director of Refrigeration Service Engineers Society as the result of a survey sent out to 770 servicemen.

Based on the 400 replies received, the average age of these servicemen is 40.9 years. Exactly 80% of them are married. Each has an average of 1.6 children. 43.3% of them rent the homes they occupy, while 56.6% either own their homes or are in the process of buying them. Each has been employed in the refrigeration service business for 13.9 years.

Educationally speaking, 66% of all the servicemen replying have attended a technical school, 26.6% have attended college, and 50% of the entire number have received training from a refrigeration and air conditioning trade school.

Some insight into the spare time activities of these men is offered by the fact that 63.3% are members of RSES, 13.3% are members of the American Society of Refrigerating Engineers, 10% are members of such service clubs as Rotary, Optimist, and Lions, and 36.6% are members of local civic groups.

"But, Honey . . . . I was sitting up with a sick ice cube maker."

I DO IT THIS WAY

WHEN checking hermetic units, it is often difficult to attach an ordinary alligator clip test cord to the prong type terminals found on some units. To overcome this I use a three prong "cinch" terminal block with about 1 ft. of coded (run, start and common) three-wire cord attached to it. This terminal block is placed on the unit and the test cord attached to the ends of the three wires, which have been bared and soldered to prevent fraying. This method saves time, and reduces the danger of shorts and blown fuses.

Henry Carlou
Saskatoon, Saskatchewan, Canada

Be Sure Your Job Estimates Provide for Proper Profit

Whether a refrigeration serviceman's business shows a profit or loss at the end of the year depends in large measure upon how accurately he estimates the price of his jobs. Never forget that to come out ahead of the game it is necessary to price for profits.

Two major mistakes are commonly made by servicemen who might be excellent technicians but poor businessmen. One is to forget to allow for the regular overhead of the business, those unseen but nonetheless important items such as lights, power, stationery, rent, and advertising that are related to the business as a whole rather than to any particular job. The other mistake is to allow the wrong margin for profit. Either of these errors can prove an important factor in determining whether red ink or black is used on your year-end statement.

I DO IT THIS WAY

IMPROPER installation of replacement coil and laminated iron around clock motors in Paragon 305-306 time clocks will cause the clock to run backwards. To prevent this from occurring, check position of old coil and iron before replacing with new units. If clock should run backwards, turn coil and laminated iron around. Clock should then run in a clockwise direction.

Al J. Dalpiaz
Dennison, Ohio

How To Use a Hacksaw For Cutting Tubing

Properly designed cutting tools, a variety of which are readily available from any refrigeration wholesaler, are naturally most desirable for cutting copper tubing, but occasionally a serviceman may be faced with a need for cutting tubing when no proper tool is available, or when the tube to be cut is larger than the tool at hand will accommodate.

In such instances, the use of a hacksaw is the next best bet, but extreme care should be utilized when cutting tubing in this manner. Here are some practical pointers on the proper use of hacksaws for this purpose:

(1) Choose the right blade. This cuts wear and tear on the blade and keeps costs down. (2) Choose the right tooth for size and shape of material to be cut (see accompanying recommendations). A fine

Use FINE RAPID Refillable DEHYDRATORS

AND SAVE $800 A YEAR!

Eliminate the "Throwaway" habit—Get the "RAPID REFILLABLE" habit!

If you use only 25 dehydrators per month, you can save $800 a year by Refilling instead of using the cheapest "throwaways".

No other line gives you so much satisfaction, quality, safety, economy.

You get more safety, more satisfaction, more protection on every installation. All "RAPID" Refillable Dehydrators are UL listed.

See your wholesaler or write for catalog.

DESIGN-ENGINEERED FOR RUGGED SERVICE

FINE PRODUCTS CO.
6240 OGDEN AVE.
BERWYN (Chicago Sub.) ILLINOIS

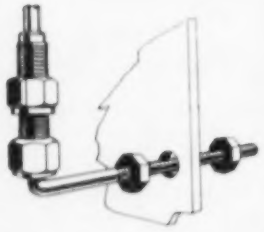
Circle No. 73 on Reader Service Card

tooth is advised on thin sections, such as tubing. (3) Blade speed should be 40 to 60 strokes a minute to assure long blade life and easier cutting. (4) Feed pressure is important. Apply pressure only on the forward stroke. Moderate pressure is most suitable on light sections such as sheet metal and pipe. Light pressure is best for soft tubing. (5) Blade tension should be taut . . . not overstrained. A loose blade will not cut straight. After several cuts with a new blade, increase tension slightly. Be sure the blade is inserted with the teeth pointing away from the handle. (6) Support the work firmly; use a vise whenever possible. To start the cut engage as many teeth as possible.

HAND SAW RECOMMENDATIONS

14 Tooth: For cutting stock 1" or over in cross section. (For soft materials where maximum chip clearance is needed).
18 Tooth: For general shop use when same blade is used on several jobs.
24 Tooth: For cross section 1/16" — 1/4" such as pipe or angles.
32 Tooth: To cut stock up to 1/6" such as light tubing.

DO IT THIS WAY



HERE'S a good way to store your most frequently used adapters in your toolbox so that they'll be clean and easy to find when you need them. Cut off the head of a 1/8" bolt and bend the bolt in a 90 degree angle. Run a nut part way up the threaded end and insert through hole drilled in side of tool box. Place another nut on threaded end outside box and tighten against side. Adapters are placed on smooth end of bolt which is fixed in a vertical position.

Wilson J. Malcik
Temple, Tex.

NEW "GENERAL" OFFICE

General Air Conditioning Corp., Los Angeles, announces the opening of a new office at 1925 Church St., Nashville, Tenn.

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Don't take chances! specify precision made

PROSTACO

COMPRESSOR REPLACEMENT PARTS

For precision fit, long life and dependable service, it'll pay to rely on the know-how and manufacturing ability of Production Stamping Company.

Above is just one of several hundred compressor replacement parts for all makes and models. This is a replacement check valve for Coldspot, an exact duplicate of the manufacturer's original. It comes completely assembled, ready to fit into place without grinding or lapping.

Write today for latest free catalog

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WITT Air Cooled Condensers

for SINGLE OR MULTIPLE COMPRESSOR INSTALLATION

and NO WATER REQUIRED

SIMPLE AUTOMATIC CONTROL SYSTEM FOR WINTER OPERATION

WITT offers a simple, low price method of keeping head pressure sufficiently high in extremely low temperatures. This applies even where a multiplicity of condensing units are connected to one condenser.

Where water supply is taxed or limited, drainage facilities inadequate or water corrodes water cooled condensers, the sensible answer to your air conditioning or refrigeration condensing problem is a WITT AIR COOLED CONDENSER.

Same units are applicable for indoor or outdoor installation. Available in two to 20 ton capacities or multiples thereof.

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Coldin Your Key To Better Refrigeration

COLDIN CABINET CO., Inc.

2800 Webster Ave., N. Y. 58, N. Y.

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OPPORTUNITIES

(Classified Advertising)

Rates: for "Positions Wanted," $6.50 minimum, limit 25 words. For all other classifications, $8.00 minimum for 25 words or under, each additional word 20¢. Boldface type or all capitals, $10.00 minimum for 25 words or under, each additional word 25¢. All classified advertising payable in advance.

POSITIONS AVAILABLE

PRODUCT DEVELOPMENT ENGINEER, for an established, progressive, rapidly growing commercial refrigerator manufacturer. All modern company paid benefits. Engineering degree not necessary. However, sheet metal experience important. This is a splendid opportunity for a man "Road Blocked" by seniority or other reasons beyond his control. FOSTER REFRIGERATOR CORPORATION, HUDSON, N. Y.

BUSINESS OPPORTUNITIES

SALESMEN-AGENTS make extra money sell nationally advertised automatic Sno-ball, Sno-cone machines on easy terms. SNO-MASTER MFG. CO., 124-CR Hopkins Place, Baltimore 1, Md.

. . . for the BEST solution

Think of Tenney!

Performance-Proven Units for every Refrigeration and Air-Conditioning Application.

Tenney ENGINEERING, INC.

1090 SPRINGFIELD ROAD, UNION, N. J.

Plants: Union, N. J. and Baltimore, Md.

ENGINEERS AND MANUFACTURERS OF REFRIGERATION AND ENVIRONMENTAL TEST EQUIPMENT

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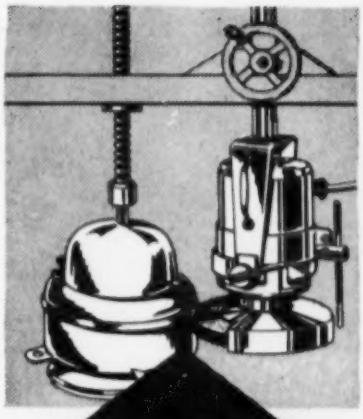

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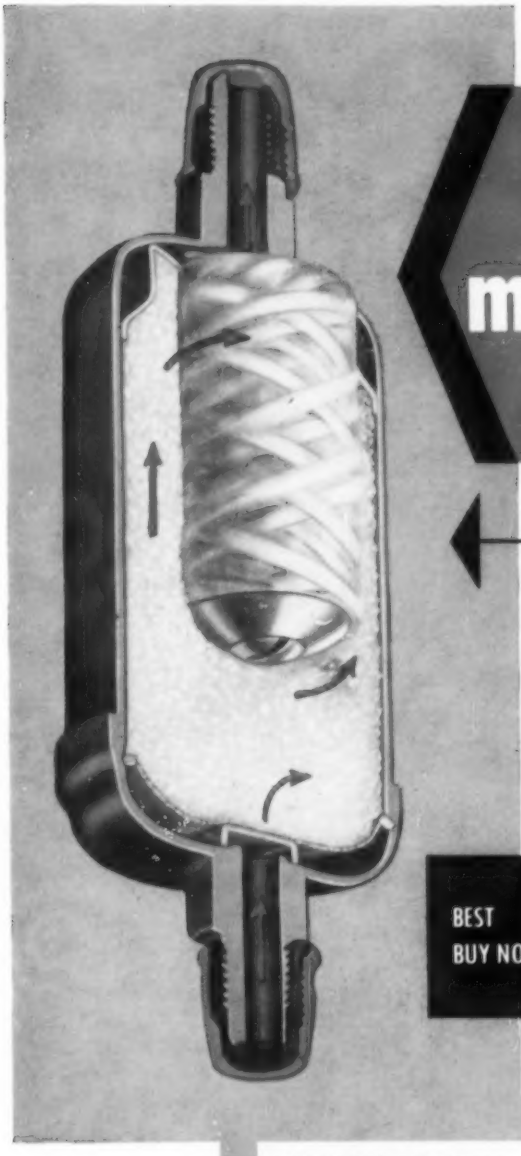


Stop acids, moisture and dirt

...and you stop valve trouble

Model 410 TRAP-DRI assures a 100% clean system — combines depth filtering with amazing PA 400 silica gel

Never before such positive protection against corrosive acids and moisture in refrigeration systems!

- 100% acid removal — positive protection against corrosive action.
- New PA 400 silica gel provides 98% greater moisture adsorption capacity than silica gels previously available.
- "Depth filtration" system offers more filtering area than any other drier on the market.
- No appreciable pressure drop — less than 1 lb. at rated Trap-Dri capacity.
- Moisture and acid removed by *physical adsorption* rather than by chemical action.
- PA 400 reduces moisture level of Freon 12 to less than 10 parts per million at temperatures as high as 160° F.
- Hermetically factory-sealed against moisture.
- Listed by Underwriters Laboratories.

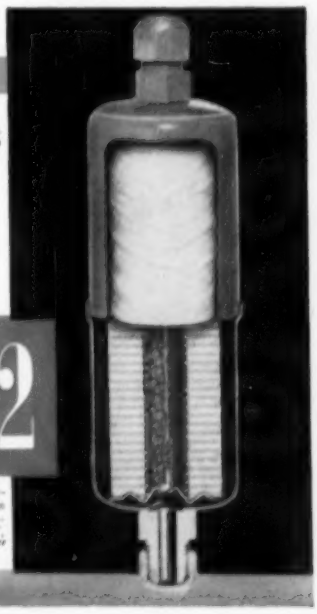
BEST BUY NO. 1

Trap-Dri is available in 20 models — flare and solder connections — for systems from 1/3 to 12 tons.

Model 408 TRAP-IT traps impurities as small as 5 microns

Here's the best performance insurance any expansion or solenoid valve ever had.

- Traps all impurities such as scale, gummy deposits, and particles of solder as small as 5 microns.
- Has many times the filtering and absorbing area of a conventional strainer.
- Contains nothing which can dissolve, damage or enter the refrigeration system.
- Protects valves against sticking slow action.
- Underwriters listed for LP-Gas and refrigerants.



BEST BUY NO. 2

Model 408 Trap-It is available in 3 sizes. Connections are ¼", ⅜", ½", and ⅝" SAE.

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DEPENDABLE *Controls* — *For Air • Liquids • Gases • Refrigerants*

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IT'S A GOOD BUY!

WHAT?

The MARCH, 1956

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BECAUSE

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